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UNC MEDICAL BULLETIN

SPRING 2009

Twenty years of heart and lung transplant at UNC

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Creating a CAROLINA LEGACY

Photos by Steve Exum

FITCH (*left*) AND WILCOX

✦ *Professorship Honors Friendship* ✦

R.B. FITCH HONORS LONGTIME FRIEND BEN WILCOX WITH ENDOWED PROFESSORSHIP IN CARDIOTHORACIC SURGERY

FOR THE FIRST 30 years of their friendship, Ben Wilcox always whipped R.B. Fitch on the tennis court. But 10 years ago they switched to golf, and now Fitch is making a comeback.

FITCH '55 JOKED that he's using all the money he's won on the golf course to fund a gift to the Carolina First Campaign. In reality, he used appreciated stock to fund a charitable remainder trust that will ultimately endow the Benson R. Wilcox Distinguished Professorship in Cardiothoracic Surgery, in honor of his friend. Wilcox '53 '57 (MD), an expert in congenital heart disease, pediatric cardiac morphology and pediatric chest disease, has worked at the UNC School of Medicine since 1963. From 1969 to 1998, he served as chief of the Division of Cardiothoracic Surgery.

WHEN HE WAS considering making a gift, Fitch said, he wanted to give to UNC Hospitals, honor Ben and convert some appreciated stock into retirement income. So he created a charitable remainder trust, which pays him income for life. In addition, he received a sizable income tax charitable deduction. At Fitch's death, the proceeds of the trust will be used to fund the professorship. He called the gift a win-win-win proposition. "It was just the thing to do," he said.

FITCH, WHO IS developing Fearrington Village south of Chapel Hill, said he has always been impressed by his friend, whom he met in the early 1960s when their families lived across the street from each other. "I like to be associated with people on top of their game," Fitch said. "And he was always on top of his game in cardiothoracic surgery." Wilcox, who operated on more than 2,000 children during his career, has retired from the operating room but remains a professor in the Department of Surgery.

A LIFELONG Chapel Hill resident, Fitch said he feels like he's grown up with UNC Hospitals. Fitch's father, R.B. Sr., and wife, Jenny '60, were treated there. Wilcox operated on Fitch's father most of one night, and Jenny fought a long battle with breast cancer before her death in 1995. "Anything having to do with illness or the hospital, Ben was my go-to guy," Fitch said. "Every time I turned, there was Ben."

If you're interested in a "win-win-win" proposition that could increase your income, save taxes and benefit the UNC Hospitals or School of Medicine, please contact Jane McNeer, vice president of The Medical Foundation of North Carolina, Inc., at 919-966-3946 or 800-962-2543 or Jane_McNeer@med.unc.edu.

The Berryhill Society

UNC
THE MEDICAL FOUNDATION OF NORTH CAROLINA, INC.

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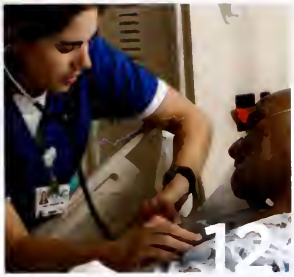
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ON THE COVER

Dr. Michael Mill (center) led UNC's Heart Transplant Program for more than 20 years and has served as chief of the Division of Cardiothoracic Surgery since 2000. For more on Mill and the history of UNC's heart and lung transplant programs, turn to page 2.

Photo courtesy of Dr. Michael Mill

An Affair of the Heart ... and Lungs

Twenty years of heart and lung transplant at UNC Hospitals

BY EDWARD BYRNES

When Dr. Ben Wilcox recruited Dr. Michael Mill to be a part of UNC's fledgling heart-lung transplant program in 1988, Mill took comfort in the knowledge that Wilcox, then the chief of the Division of Cardiothoracic Surgery at UNC, already had two transplant surgeons on staff starting up the program. But by the time Mill arrived on campus, both of those surgeons had left.

"It was a challenge, but it was a good challenge—having to walk in and essentially resurrect a program and do it the way I wanted to," recalls Mill, now chief of the Division of Cardiothoracic Surgery at UNC Hospitals.

Mill had attended medical school at the University of Colorado, where Dr. Thomas Starzl was the chair of the surgery department. Starzl had performed the department's first successful kidney transplant in 1962. Four years later, in 1967, Starzl became world-famous when he performed the first-ever successful liver transplant.

When Mill arrived in Denver in 1976, Starzl was already well known as "the father of liver transplantation." Although organ transplants were being done in several places across the country, there was still no structured way to obtain donor organs. But Starzl's program was widely known throughout Colorado, and during Mill's five years of general surgery training there, he was often pulled into service to retrieve donor organs or entire bodies from all across the state.

"We'd go out on 'donor runs' and get kidneys, or we'd bring a body back for [Starzl and his team] to do a transplant," Mill recalls.

And Mill remembers how Starzl would commandeer the operating room and situate the donor in one room with multiple recipients prepared for transplants in adjoining rooms.

"He'd have the donor in one room, the kidney recipient in another, and a liver recipient in a third room. He'd have one team taking out the kidney in one patient and another team taking out the liver in the other patient while he'd be harvesting the organs from the donor. Then he'd take the liver over and transplant it in the first recipient and then he'd go to the next room and do the first kidney transplant in there. Then, by that time, they would have gotten the second kidney recipient in and put him to sleep. Starzl would go in and do the second kidney transplant. Then he'd disappear for a day or two," says Mill with a laugh.

Mill left CU for Stanford, where he spent three years in residencies in cardiovascular and thoracic surgery. He also spent six months of that time as a chief resident

and fellow in heart and heart-lung transplantation, training under the tutelage of Dr. Norman Shumway, the pioneering surgeon who performed the first successful heart transplant in the US in early 1968.

Like Starzl, Shumway is considered a giant in the field of organ transplantation. Although South African doctor Christiaan Barnard had performed the world's first heart transplant in Cape Town one month before Shumway did his first at Stanford, Barnard did so using techniques that Shumway and his first chief resident, Dr. Richard Lower, had developed over the previous decade. And Shumway was one who refused to give up on the procedure when persistent organ rejection led most others to abandon it for much of the 1970s.

Now at UNC, Mill couldn't keep the young heart-lung transplant program he had inherited going all by himself, even though he performed his first transplant at UNC within a month of his arrival. Transplant operations are extremely labor- and resource-intensive and require an enormous team effort to accomplish efficiently and with the best chance for success. In addition to the surgeons, nurses, and surgical technicians, transplant requires anesthesiologists, transplant coordinators, cardiologists, pulmonologists, pathologists and many others whose expertise must be brought into the fold. "It is a huge institutional commitment," says Mill.

For one year, while Wilcox worked on recruiting another surgeon, Mill forged on and drew together, from all corners of UNC Health Care, the multidisciplinary team the program needed. In July 1989, Dr. Tom Egan, a young surgeon with both heart and lung transplant experience, was hired to join Mill at UNC.

Egan graduated from medical school in his home city at the University of Toronto in 1976 and, after three years as a medical officer and flight surgeon at the Canadian Forces base in Chatham, New Brunswick, returned to the University of Toronto. There, he spent the next eight years training in general, thoracic, and cardiovascular surgery, including two years as a resident and research fellow in the Division of Thoracic Surgery. It was there that Egan met Dr. Joel Cooper and began working in his lab.

At the time, lung transplant was only being done as a heart and lung block—both lungs and the heart together—making it an unwieldy and inefficient procedure. However, in early November 1983, during Egan's first year in Cooper's lab, Cooper performed the first successful isolated lung transplant.

"There was kind of a rivalry, between the Stanford group and the Toronto group, about whether you needed to do heart and lung versus isolated lungs, and Cooper proved that lungs could be done by themselves," said Egan, now UNC's associate division chief for General Thoracic Surgery. Egan and Cooper worked together on techniques to perform bilateral lung transplants, and Cooper and his group performed the world's first successful double-lung transplant in Toronto in 1986.

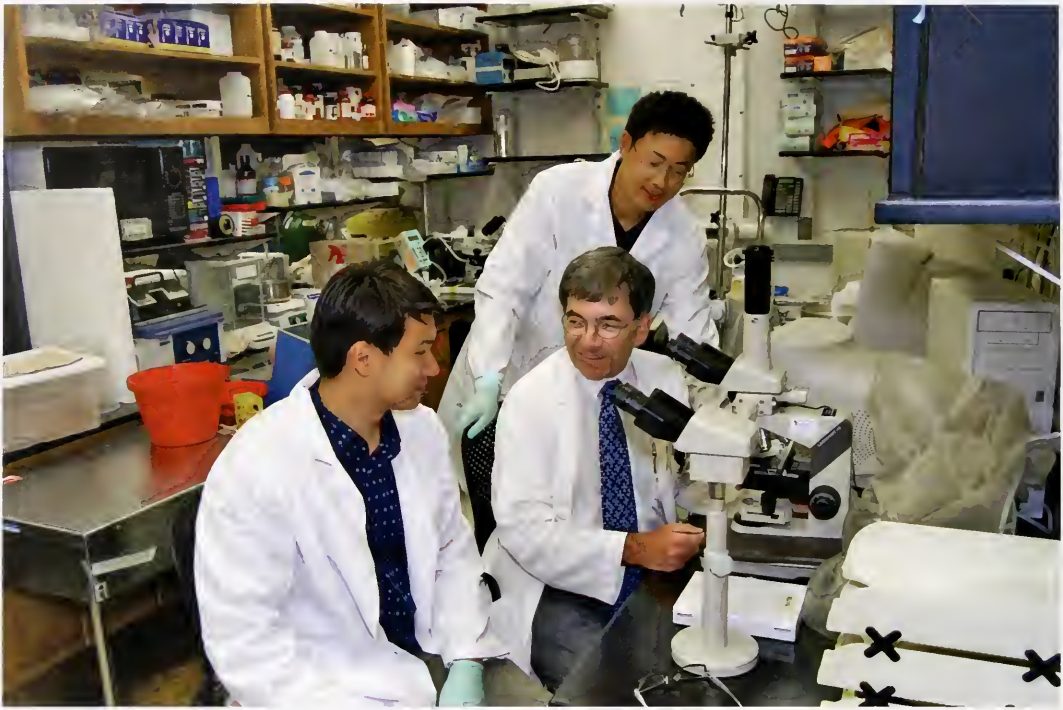
When Cooper left the University of Toronto in 1988 to start a lung transplant program at Washington University in St. Louis, Missouri, he brought Egan along with him. But it wasn't long before Wilcox called, offering Egan a chance to start up a lung program of his own, in conjunction with Mill's heart program, at UNC.

"It made for a very productive relationship, because he was the head of the lung transplant program and I was the head of the heart transplant program," Mill said. "So if he was doing a lung transplant, I could go get the lung for him. If I was doing a transplant, he'd get the heart for me. If one of us was out of town, the other could do the operation."

Transplant at UNC today

In 2009, 20 years after the establishment of UNC's heart and lung transplant programs, the face of transplant surgery at UNC, as well as around the world, has

Dr. Michael Mill (left) with Dr. Norman Shumway in 1990. Shumway was visiting UNC at Mill's invitation to speak about his groundbreaking work in heart transplant surgery



Thomas Egan, MD, MSc, (center), working with John Abano, MD, left, and Boming Dong, PhD, right.

changed as much as it has stayed the same.

What is different is that UNC's cardiothoracic transplant programs have grown enormously.

"We now have two heart transplant coordinators, two separate lung transplant coordinators, and we have three heart transplant cardiologists where we originally started with none. We have lung transplant pulmonologists; on the heart side, we have our separate, dedicated Heart Failure and Transplant Service (led by Dr. Patricia Chang) in the hospital that admits patients rather than them being readmitted to my service, which we did for years," Mill explains.

And although he has switched from doing adult heart surgery to doing primarily congenital heart surgery in children, Mill has hired several more surgeons. Like Wilcox (now emeritus chief of the Division of Surgery) had done before him, Mill has also been able to pull these individuals from some of the top programs in the country.

Dr. Mike Bowdish, who joined UNC's cardiothoracic surgery team last year, had recently completed his cardiothoracic surgery residency at Columbia University-New York Presbyterian Hospital. Presbyterian performs between 70-100 heart transplants a year, an astronomical number considering there were 73 heart transplants performed in all of the state of North Carolina in 2008.

Dr. Brett Sheridan, who came to UNC in 2002, finished his residency in cardiothoracic surgery at the University of Colorado and now heads UNC's Heart Transplant Program, as well as serves as director of its Ventricular Assist Device (VAD) Program. UNC is one of only two programs in the southeastern US that is approved to implant VADs as destination therapy—that is, implanting the assist device not just as a "bridge" to getting a transplant as is normally done, but as the patient's final repair.

"When I first started out we got one device, then a second device. But in just the last five years, with the addition of other faculty members to help out with the effort, and with the improved education of the cardiologists in terms of using the devices and when to refer patients for them, we now have five or six different devices—almost everything available in the world," says Mill.

CONTINUED ON PAGE 6

UNC study hints at new approaches to prevent transplant rejection

To prevent the rejection of newly transplanted organs and cells, patients must take medicines that weaken their entire immune systems. Such potentially life-saving treatments can, paradoxically, leave those receiving them susceptible to life-threatening infections.

Now researchers at the UNC School of Medicine and the UNC Lineberger Comprehensive Cancer Center have discovered what seems to trigger the immune system to attack transplanted cells in the first place.

The finding could help chart a course to completely new therapies that may prevent graft-versus-host disease—the main cause of transplant failure—and its sometimes fatal complications.

The study has identified a subset of cells—named TH17 cells—that can cause the condition. Until now, without a clear understanding of the disease, clinicians have had little choice but to treat transplant patients with toxic regimens of steroids and immunosuppressive drugs.

"Our hope is that uncovering the mechanisms that cause graft-versus-host disease will allow for treatments that specifically target its causes and do not have the harmful side effects of traditional therapy," said study lead author Jonathan S. Serody, MD, a member of the Lineberger Center and the Elizabeth Thomas Professor of Medicine, Microbiology and Immunology at UNC. The results of the study appeared in the Feb. 5, 2009, issue of *Blood*, the journal of the American Society of Hematology.

Graft-versus-host disease (GVHD) is a serious complication of transplants that occurs when the donor's marrow (graft) produces immune cells that attack multiple organs of the recipient (host), typically the skin, gastrointestinal tract and liver.

Until recently, scientists believed that most of the disease's problems came from the production of specific molecules called interferons, a class of proteins that arise in response to foreign agents like viruses and parasites.

However, when several researchers tried testing whether or not blocking the action of these proteins would diminish graft-versus-host, they found that getting rid of interferons actually made the disease worse. When Serody and his colleagues tried this experiment themselves, they found that blocking the action of interferons resulted in a huge increase in the number of a specific group of white blood cells, or T lymphocytes, called TH17 cells.

To determine if these cells were actually aggravating the disease, they first cultured, expanded and purified cells of the TH17 lineage. In a technique pioneered by Michael J. Carlson, PhD, a postdoctoral fellow in Serody's laboratory, immature lymphocytes were incubated in Petri dishes with a cocktail of proteins that "programmed" virtually all of them to become TH17 cells.

Jonathan S. Serody, MD

When the researchers transplanted the purified cells into mice, they found that the cells did in fact cause graft-versus-host disease, with the most severe damage to the lung and skin. Not only did these findings implicate TH17 cells in the disease, but they also generated one of the first mouse models to display acute GVHD skin changes—consistent with the most common manifestations of the disease in humans.

Having identified the role TH17 cells play in the disease, Serody and his colleagues then wanted to know what substances the cells were producing to cause it. They knew that TH17 cells produce a number of specialized proteins—called inflammatory cytokines—that are involved in communication between cells during the immune response. So they methodically blocked the action of each of these cytokines to determine which ones were actually causing the damage to various organs of the transplanted mice they were studying.

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An Affair of the Heart ... and Lungs

continued from page 4

Increasing the donor pool

One of the things that remains the same is the quest to improve the pool of donor organs, which, unfortunately, isn't as simple as getting more people to indicate their donor status on their driver's license.

"Most individuals who are conventional organ donors are people who have had a massive brain injury. They get intubated, put on a ventilator, and then their brain dies. Within the legal definition of brain death, we can declare them dead and then they can either be taken off the ventilator and—because their breathing is controlled by the brain, which is now dead, they don't breathe—they eventually run out of oxygen and their heart stops. Or, if they want to be an organ donor, or if their family wants them to be an organ donor, then the organ procurement people get involved and there's a process of evaluating the organs. And as long as they remain on a ventilator and their blood is oxygenated, the heart continues to beat because it does so automatically and it perfuses the liver and kidneys and other organs that might be transplanted," Egan explains.

The Medical Lung Transplant Team: Isabel Neuringer, MD, Ken Davis, RN, Becky Cicale, RN, and Peadar Noone, MD. Photo courtesy of Dr Isabel Neuringer

Two problems that occur with conventional lung donors, Egan says, is that many people who suffer a traumatic brain injury vomit at the time of the injury and aspirate that vomit into their airways, which frequently causes pneumonia. Second, severe brain injuries can cause fluid to leak into the lungs, a condition called neurogenic pulmonary edema. "You end up with people who are brain dead in ICUs and only a percentage of those had consented to be organ donors. And then of the ones that had consented, only about 25 percent of those have lungs that are sufficient for transplant," Egan says.

Egan no longer performs surgery, but the shortage of transplantable lungs has been a research interest of his since he came to Carolina. And because UNC has its Cystic Fibrosis Pulmonary Research and Treatment Center, he has had a lot of first-hand experience with very ill patients who need lungs and might not get them in time to save their lives. In 1999, the Organ Procurement and Transplantation Network (OPTN)—established by the US Congress under the National Organ Transplant Act (NOTA) of 1984—asked Egan to sit on the Thoracic Organ Committee to assess the lung allocation system and make recommendations for improvement. What they came up with was a system that calculated a potential recipient's pulmonary function and other medical information to devise a score that determined that recipient's need. So, instead of just putting patients on the list and simply making them wait for their turn, lungs could be transplanted into patients according to how badly they needed them. The system, after some revisions, went into effect in May 2005.

"We went from transplanting 1,000 lungs a year in the US to 1,400 almost immediately—a 40-percent increase in the number of lungs being transplanted—and those numbers have held up since 2005. That's still not nearly enough, but it's a big jump," says Egan. "And we cut in half the number of patients dying on the waiting list from 500 per year to around 250."

Another way in which Egan hopes to increase the number of lungs available for transplant is by achieving

the approval of using lungs harvested from non-heart-beating donors (NHBDs). The term NHBD refers to people who have sustained cardiac arrest and have died either in their homes, in public, or in the emergency room.

The lungs, unlike other solid organs that are transplanted, can remain viable for hours after the heart stops. Until now, NHBDs were not considered candidates for organ donation for transplant, and no one is certain how many lungs might be suitable for transplant following the recovery of lungs after circulatory arrest. But Egan's long-term goal is to see the introduction of NHBDs in human lung transplantation so that the lung donor shortage can be eliminated.

"If lungs could be retrieved from non-heart-beating donors, the critical shortage of lungs for transplant could be alleviated further, if not entirely. An obstacle to this approach is the inability to predict these lungs' suitability for transplant, so we developed a method to perfuse and ventilate human lungs ex-vivo to assess gas exchange and vascular resistance, and to perform bronchoscopic inspection and radiographic evaluation," he says.

If lungs could be retrieved from non-heart-beating donors, the critical shortage of lungs for transplant could be alleviated further, if not entirely.

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Dr. Ben Haithcock, assistant professor of surgery at UNC Hospitals and current director of UNC's Lung Transplant Program, is the principal investigator in a study with Egan using ex-vivo perfusion to evaluate lungs retrieved from NHBDs. The lungs can be evaluated—and even treated should fixable problems be detected—and transplanted, with the potential of making thousands more lungs available to patients who need them. So far, transplantation of lungs after ex-vivo perfusion has been done successfully in animal studies and in a few humans.

Fighting rejection

Still, a war rages on in the fight to stop the body's tendency to reject donor organs after they're transplanted. Among her many responsibilities, Dr. Isabel Neuringer, a pulmonologist and co-medical director of the Lung Transplant Program, follows patients' progress post-operatively, along with Dr. Peadar Noone, the program's medical director, and pulmonologists Drs. James Yankaskas and Raymond Coakley. The medical team works closely with cardiothoracic surgeons Haithcock, Bowdish, and Dr. Nancy Wampler, as well as transplant coordinators Rebecca K. Cicale, RN, and Ken Davis, RN, to provide continuity of care and follow-up. Neuringer and her colleagues must rigorously diagnose and anticipate the development of infection and rejection, which are commonly encountered during the first year post-transplant. Compared to the early era of lung transplantation, there are now immunosuppressants that inhibit multiple pathways; potent antibiotics; and improved antivirals for the prophylaxis and treatment of cytomegalovirus disease.

"We know a little bit more about how lungs reject, what the pathways are, how to use medicines more effectively, and how to individualize therapy—because everyone may reject in their own different way," she says.

As we gain more understanding of the immune response, research is yielding more potential solutions. Over the past few years, Neuringer says, there have been some advances in rejection regimens, and acute rejection can be fought with new biologics—which, in this case, are antibodies that that block the harmful cells produced by the body. But, she adds, the one major limitation that occurs across all transplants is chronic rejection. The majority of lung transplant patients develop some degree of chronic rejection, which is challenging to treat, but may be stabilized with augmented immunosuppression, a certain class of antibiotics which have anti-inflammatory properties, and newer biologics.

"In lung transplant, chronic rejection ends up as scarring of the small airways. In the heart it may manifest as coronary artery vasculopathy, the liver as bile duct occlusion, and the kidney as chronic allograft nephropathy damaging the renal tubules and causing scarring. So there's a similar form of a chronic response against the graft across the board," Neuringer explains. "And we're all still trying to learn more about common pathways of rejection and how to fight it. Luckily, the majority of our patients can overcome the routine medical complications and have improved quality of life.

"Our patients have pursued their life-dreams of acting, teaching, graphic arts, triathlon competition, medical school, engineering, accounting, information technology, horse-training, motivational speaking and counseling, among many other accomplishments," says Neuringer. "We are proud and honored to participate in their successes, helping them in their goals."

http://www.archive.org/details/uncmedicalbullet562009medi

Rolling with the Changes

In response to the changing health care landscape in North Carolina, UNC is making strides to cover all bases—in patient care, education, and research

BY MARGOT CARMICHAEL HECTER

New challenges in health care demand new approaches to the way care is delivered, patients are treated, research is undertaken, and operations are funded. Just consider these facts:

- North Carolina's population will grow by more than half to almost 13 million by 2030.
- The state's population is aging rapidly.
- The number of Spanish-speaking citizens is growing dramatically.
- The rates of cancer, heart disease, diabetes and obesity are rising rapidly.
- The amount of uncompensated care UNC must give is increasing.
- There is a shortage of physicians, surgeons and other healthcare professionals.

As the landscape continues to change, the School and UNC Health Care must adapt and march forward. "As we face these tight economic times, our needs don't come before everyone else's," said Dr. William Roper, dean of the School of Medicine and chief executive officer of UNC Health Care. "Instead, we need to make sure we talk about these issues, are smart with the resources we have, and that we continue to lay the groundwork to meet our state's health care needs in the future."

To do that, the School and UNC Health Care have embarked on an aggressive course of action. "If we're going to stay ahead of the curve in delivering accessible, quality health care throughout the state, we will need more—more doctors, more research, more facilities," Roper said. "We will need better—better medical education, better technology, better patient outcomes."

Improving access to health care

North Carolina's population is expected to increase by 4 million residents in the next 20 years. That's roughly equivalent to all the current residents of South Carolina picking up and moving to the Old North State. Almost 2 million Tar Heels will be aged 65 and older, meaning they'll have an increased need for health care. And approximately three quarters of a million will be Spanish-speakers, creating a need for health care providers who know the language and are familiar with the culture. These demographic realities must be met head on.

"Given our aging population, we need to be the leaders in this area," said Dr. Marschall Runge, professor and chair of the Department of Medicine and president of UNC Physicians. "We're doing research on conditions affecting the elderly and developing the best ways of delivering care to them. It's much different than caring for middle-aged and young people."

One way UNC is tackling the issue is through The Center for Aging and Health, developed by the Department of Medicine and the UNC Center on Aging. The Center provides care to almost 1,500 patients each year through UNC Hospitals and other sites. It also sponsors a fellowship program and provides online and traditional training opportunities for geriatricians and others who care for older adults.

Helping Latinos use and navigate the health care system also requires direct action. Last year alone, UNC Health Care's 16 full-time interpreters provided translation services to 60,000 patients, enabling them to access the best health care in the state.

"The challenge will be training medical school graduates—particularly those going into family and internal medicine—to deal with a more diverse population," said Margaret Dardess, associate vice chancellor for strategic alliances for the School of Medicine. "We have various programs to help medical students get instruction in health literacy and direct experiences of treating Spanish-speakers."

For instance, in the Comprehensive Advanced Medical Program of Spanish (CAMPOS) program, developed by the departments of Medicine and Family Medicine, participating students take special electives and often work in communities with a large Spanish-speaking population to help them develop medical and language skills (for more on this, see "Paso A Paso" on page 12 of the *Bulletin's* Fall 2008 issue).

Building more capacity

Caring for more people will require more health care providers and hospital beds. "Particularly in the Research Triangle area, hospitals are already running at capacity," said UNC Hospitals President Gary Park. "Between people living longer and in-migration, we're going to need more inpatient beds in the next several years. We are already going through a Certificate of Need process and have undertaken an aggressive building plan to expand beds." The goal is to have 1,009 more beds by 2014 (for more on this, see "Building a Healthier North Carolina" on page 2 of the *Bulletin's* Fall 2008 issue)

But more than beds, there is an urgent, growing need for health care providers—particularly primary care physicians, psychiatrists, pediatricians and general surgeons.

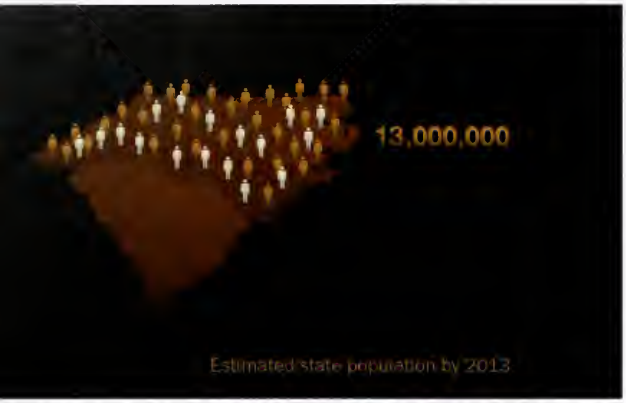
"Within 20 years, North Carolina will have 25 percent fewer primary care physicians than we need," Roper predicts. "We also have seen a decrease in the number of general surgeons in our state. As of 2004, there were 21 counties in our state with no general surgeons—and this trend continues." At the same time, the pool of nurses, pharmacists and allied health workers is shrinking. "As the health care workforce dwindles, rural areas will be hit especially hard, with fewer providers available to serve residents."

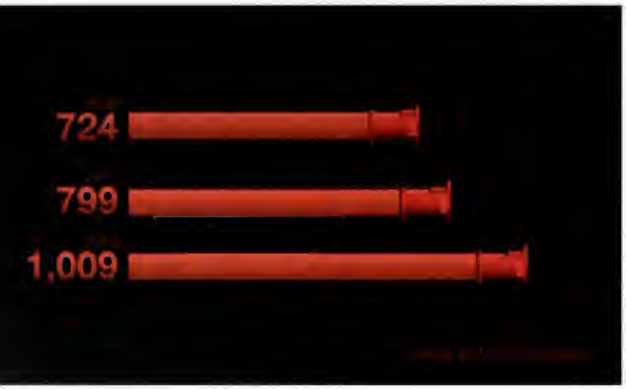
In an effort to increase the number of physicians practicing in the state, the School launched a plan to add two new campuses, one in Charlotte and one in Asheville. This expansion could add between 160 and 230 students a year, and would also improve the chances of those graduates staying in the state. The proposal was approved in late 2008 by the Board of Governors and awaits funding from the North Carolina State Legislature

UNC also is forming partnerships with regional health care organizations to provide services to those who lack access even to basic care. This will help reduce the number of patients who come to UNC Hospitals in

Chapel Hill, which is the "safety net" hospital for the entire state.

"We'd rather have them taken care of closer to home, so we're starting to work with regional health care organizations to keep those people out of our emergency room because it's the most expensive level of care," Park explained. "These programs help





us provide the best care possible to patients whether they're insured or not."

UNC Health Care joined with Piedmont Health Services to create a high-quality, cost-effective system of care for uninsured patients in Alamance, Orange, Chatham and Caswell counties. Services include care coordination, medications, and access to diagnostic and specialty services. In Manteo, it opened a regional cancer care center staffed by an oncologist who, for consults, can access specialists in Chapel Hill via teleconference. And the School and UNC Health Care joined East Carolina University's Leo Jenkins Cancer Center in Greenville to develop innovative solutions for medical education, cancer care, and research.

Treating and preventing major conditions

"In addition to our growing and changing population, the number of patients with chronic disease is also increasing, with no end in sight," Roper said. The state's citizens suffer from a growing rate of cancer, heart disease, diabetes and obesity—even though they can be prevented, or the effects of them mitigated, through screenings and comprehensive treatment.

Consider these staggering statistics:

- Heart disease is taking a toll on North Carolinians, with more than 17,000 residents dying from the disease last year alone.
- One in 10 of NC residents has diabetes now, and one in three will develop it at some point.
- The number of residents considered obese doubled between 1990 and 2005, and North Carolina continues to remain above the national average.
- More than 40,000 cancer cases will be diagnosed in the state this year, and that's projected to double in the next 40 years.

With these conditions on the rise, a robust and well-funded research agenda is critical. "We're taking a leadership role both in the state and nationally," Roper said. "UNC stands out in basic and translational research in our tireless quest for cures for these diseases, particularly cancer."

One exciting development is the University Cancer Research Fund, established by the NC General Assembly in 2007. It began with a budget of $25 million and will now provide $50 million per year for research and programs related to diagnosing, treating and preventing cancer. Additionally, UNC was one of 14 institutions selected to receive a $61 million Clinical and Translational Science Award from the National Institutes of Health last year.

"This funding will transform the way research is undertaken, allowing us to partner with communities around the state to translate new scientific developments quickly into clinical practice," Roper said. "That will provide the most benefit to patients no matter where they live."

UNC also is working to commercialize more of its discoveries. "We've not had a big budget for commercialization," said Etta Pisano, the School's vice dean for academic affairs. But she's hoping that will change under new University Chancellor Holden Thorp, who possesses a science background. "We can put experts in business together with experts in medical research to start new businesses that might create new ways to diagnose and treat disease, deliver therapeutics or improve medical technology."

We've been building for the last 15 years and the organization is sound. We continue to provide outstanding teaching, clinical care and research. But we need to get to the next level.

Pisano also hopes to increase the amount of corporate-sponsored research. "I know there's been a lot of bad press as if corporate relationships are inherently flawed because of conflicts of interests," she continued. "Academic medical centers need partnerships with industry to facilitate the transference of knowledge to the community. We're welcoming of these partnerships and need to build them to enhance our ability to influence what happens to our patients."

Minding the bottom line

It's a sad fact that many patients can't pay for the care they receive. The almost 15 percent of North Carolinians living below the poverty line and the rising numbers of people joining the ranks of the unemployed are likely to swell the amount of uncompensated care. And with the financial crisis expected to last at least 18 months longer, even more patients will be unable to pay their health care bills in full. The impact is already being felt. In 2007, uncompensated care for UNC Health Care was $203 million, or 15 percent of net patient revenue. That's up from $111 million just six years prior. And then there are expected cuts in Medicaid reimbursements.

"Cutting reimbursements at a time when people need them the most isn't the most visionary approach," Park said. "But we're the hospital for all North Carolinians, and we will provide the uncompensated care. We have figure out how to get the additional funds to solve this statewide problem. Unfortunately, I don't expect patient volumes to go down. In fact, I think we'll continue to be as busy as we have ever been or busier, but the number of paying patients will be less."

That means looking at ways to cut costs and improve efficiencies. "It's the same 'blocking and tackling' any organization's doing right now," Park said. "Our biggest expense is payroll, so we're looking at the number of full-time positions and whether or not to fill a position when someone leaves. But we need the same staff to provide the same care whether patients pay or don't pay. So we can't do wholesale reductions in workforce like a manufacturing organization can do." Systems, processes, and supply chains also are under scrutiny.

Yet even in an economic environment in which many organizations can't borrow funding for operations or expansions, UNC is in good shape. "We can go to the market and get money—that's the positive thing," Park said, adding "And the state has been very generous to us." But state funding will probably be less than in previous years given a statewide budget crunch, and what does come will likely be slow to arrive.

That makes alumni support even more crucial, Runge added. "Many alums have a passion for a certain disease or condition. You can focus your donations on helping us in those areas, and that will go a long way to making a bright future for UNC."

Pisano agreed. "We need to work hard to stay where we are and not lose ground," she said. "We've been building for the last 15 years and the organization is sound. We continue to provide outstanding teaching, clinical care and research. But we need to get to the next level. Alumni can help by assisting us in building our endowment and spreading the word about what we do."

Though myriad challenges face the School and UNC Health Care, its leader remains confident. "We are dedicated to providing care statewide, training health professionals and researching new discoveries," Roper said. "It will take all of us—every health care provider, every elected official, every business leader and every citizen—to rise to the challenge before us. But we will meet the challenge."

Pillars of Strength

UNC Health Care uses patient care and performance improvement initiatives to ensure satisfaction of patients and employees

BY WENDY LOUGHLIN

In 2004, when the US Food and Drug Administration approved the use of the Merci Retriever for the treatment of ischemic stroke patients, UNC Hospitals was among the first nationwide to offer the procedure.

A corkscrew-like device, the Merci Retriever is threaded into the artery and used to capture and remove the clot. But the procedure is only approved for use within eight hours of the onset of stroke symptoms. "Time is essential," says Dr. Brian P. Goldstei, chief of staff of UNC Hospitals and executive associate dean for clinical affairs at the School of Medicine. "It has to happen fast if it's going to benefit the patient. And that takes a high level of coordination between EMS, the Emergency Department, the neurologists and the interventional radiologists who actually do the procedure."

Goldstein recalls a time, shortly after the procedure became available at UNC, when a patient came into the Emergency Department exhibiting acute stroke symptoms. "He got evaluated quickly, he got [MRI] scans quickly, he was deemed to be a good candidate for the procedure and he got the procedure quickly," he says. The patient survived the stroke and eventually fully recovered. For Goldstein, the incident is an example of the high quality of care that UNC Health Care strives to offer. "Team work across traditional boundaries is especially important," he says. "When you are able to work together in a coordinated fashion, you can achieve very high quality outcomes that many hospitals are not capable of."

But it's not just about quality of care—it's also about the patient's perception of care, and a recognition of the link between the two. "There are two major components to our drive to provide the highest quality care," says Goldstein. "One is delivering the appropriate medical services using the latest evidence, achieving the best outcomes, and maximizing patient safety according to our own professional standards. The second is, from the perspective of the patient's experience, doing what's necessary to make sure we are addressing the things that are important to the patient's perception of his or her care.

"We have gotten better as an organization at being attentive—in a more consistent way—to the patient's needs, to making sure we're actively addressing any concerns or anxieties they might have."

The Commitment to Caring Inpatient Experience Team announced that a Welcome Bag is now offered to each newly admitted inpatient. The bag contains personal care products including shampoo, conditioner, a toothbrush, hand sanitizer, and lip balm.

Photo by Will Arey

Commitment to Caring

About two years ago, UNC Health Care engaged the services of the Baptist Healthcare Leadership Institute, which guides hospitals and other healthcare organizations toward the goal of achieving performance excellence through hands-on mentoring, skills transfer, and sharing of best practices. In particular, Baptist focuses on patient satisfaction; employee retention, satisfaction and engagement; physician satisfaction and loyalty; leadership effectiveness and accountability; quality of care; and process improvement.

Out of UNC Health Care's work with Baptist came Commitment to Caring, an institutional initiative launched in 2007 with the goal of improving the health care experience for UNC patients, their families, and the staff. Goldstein described the initiative in that year's annual report: "Commitment to Caring is intended to summarize our quest to simultaneously improve everything that impacts clinical care—that is, the quality and safety of care, our efficiency, how we support each other and how we deploy new knowledge to help patients. These are not new goals, but our physicians and our hospitals have often not been in sync about how to achieve them. Commitment to Caring emphasizes a unified purpose for everyone involved in patient care."

Commitment to Caring focuses on six core "pillars": People, Service, Quality, Finance, Growth, and Innovation (see sidebar at right). This broad range allows UNC Health Care to, as Goldstein puts it, "maintain an internal narrative about how you improve across the board. It's a way of talking about how you can't afford not to improve all those things simultaneously—and how you're going to pull it off."

On the ground, the implementation of Commitment to Caring involved the creation of ten employee teams whose foci ran the gamut from the patient, physician, and employee experience to communications to standards and measures. Each team was charged with making assessments and developing action plans for improvement.

One such team, focusing on the inpatient experience, created a patient information folder. "When patients are admitted to the hospital, they receive a cadre of information—an incredible amount of material," says Vic O'Neal, director of patient relations. "The patient information folder serves to centralize all this information, which benefits not only our patients, but also our staff." The folder includes standard, required information—covering such topics as advanced directives and smoking cessation—as well as things like unit-specific materials and welcome letters from nurse managers, which can be added to personalize

COMMITMENT to Caring

PEOPLE | SERVICE | QUALITY
FINANCE | GROWTH | INNOVATION

People: Our colleagues and patients; Service: The care and service we provide to each other and the people of North Carolina; Quality: Ensuring patient safety while striving to improve performance; Finance: Making wise financial decisions to ensure a healthy future for UNC Health Care; Growth: Proactively adjusting to better meet the needs of the people of North Carolina; and Innovation: Developing groundbreaking research and integrating it with the latest technology in patient care.

That's how the pillars were defined within the organizations. Fleshed out, they provide specific goals and measures that move UNC Health Care toward what Goldstein calls "sustained, broad-based improvement."

The **People** pillar focuses not just on patients but on UNC Health Care staff, seeking to improve employee satisfaction and retention, encourage managers' input into decision making and create a more visible role for senior management.

The **Service** pillar seeks to bring the voice of the patient and families to service design and delivery. Increasing patient satisfaction—among hospital as well as clinic patients—is a major goal.

The **Quality** pillar goals focus on specific measures, such as improving heart attack, heart failure, and pneumonia care, reducing catheter-associated blood stream infections, and increasing surgical infection prevention.

The **Finance** pillar aims to exceed operating, net income, and net cash flow targets through frequent meetings with direct reports and close monitoring of budgets by managers.

The **Growth** pillar sets forth coordinated efforts of the administration and physician leaders as well as strategic planning as methods to improve patient throughput, open new beds on schedule and exceed discharge, surgery and Emergency Department targets.

The **Innovation** pillar is seen as especially important to an academic medical center. The School of Medicine plays a pivotal role in helping to implement clinical innovation projects—for example, a searchable data warehouse, which amalgamates clinical and operational information from across UNC Health Care in order to improve efficiency, quality, safety, and customer service

Photo by Brian Strickland

the folder. It also includes a pad of paper and a pen to encourage patients and their families to write down and ask questions.

The folder is updated according to patient and staff feedback. "We know it's working," jokes O'Neal, "because we learned that we should move information about [accessing the in-room televisions] from the back of the folder to page two."

O'Neal says the creation of the folder is an example of Commitment to Caring at work. "A group of employees—managers and staff together—came up with this and implemented it throughout the house. They took it on from the ground up, they own it, they make the updates," he says. "It sounds simple but it does provide a better way to do things."

Other quality initiatives have proliferated throughout UNC Health Care over the past few years. Examples include Rapid Response teams, which support inpatient physicians by bringing additional expertise to the bedside when the patient's condition is acutely changed; the Patient Access and Efficiency Initiative, which works with multidisciplinary improvement teams in outpatient clinical areas to improve access to appointments and efficiency of clinic operations and to design and implement a new scheduling, registration and billing system; and the Employee Incentive Program, which bases bonus pay on the meeting of goals in the categories of finance, patient satisfaction, clinical outcomes/patient safety, and employee satisfaction.

Patient satisfaction

The renewed emphasis on quality of care and a positive patient experience hasn't gone unnoticed. UNC Health Care's Internal Medicine Clinic was recently recognized by the National Committee for Quality Assurance (NCQA) Diabetes Physician Recognition Program (DPRP) for demonstrating delivery of high-quality care to patients with diabetes.

And last summer, the second quarterly reporting of results from the Hospital Consumer Assessments of Healthcare Providers and Systems (HCAHPS) Survey showed that 91 percent of patients said they would recommend UNC Hospitals to their friends and family.

The score was particularly notable in that it was considerably higher than the state average—72 percent—and also higher than the scores of neighboring hospitals (Duke Hospital scored 80 percent; WakeMed Health and Hospitals scored 70 percent; and Durham Regional Hospital scored 66 percent).

UNC Hospitals also fared well on other HCAHPS measures, including patients given information about what to do during recovery at home (87 percent); doctors who communicated well with patients (84 percent); staff who explained medications before giving

them to patients (74 percent); and patients whose pain was well controlled (74 percent).

"I believe these outstanding results demonstrate that our Commitment to Caring initiative is achieving the desired result," wrote Dr. William Roper, dean of the School of Medicine and chief executive officer of UNC Health Care, in a letter to employees. "Everyone who works at UNC Health Care has played a vital role in accomplishing this important goal."

HCAHPS is the first national, standardized, publicly reported survey of patients' perspectives of hospital care, administered by the Centers for Medicare & Medicaid Services (CMS). Scores were reported publicly (see sidebar at right) for the first time in August of last year, and will now be published quarterly. Because the survey is relatively new—the CMS first began collecting data in October 2006—and because only two quarters of data are publicly available so far, Goldstein points out that UNC Hospitals' scores cannot yet be seen as long-term trends; however, they do mirror the data collected by UNC Hospitals' own patient surveys, which are administered by Press Ganey. "We have scored well because I think we have tried to be very conscious of being attentive to patents' needs while they're here," he says.

Beyond recognition of "a job well done," HCAHPS scores may soon have broader implications. In the 2007 *Report to Congress: Plan to Implement a Medicare Hospital Value-based Purchasing Program*, the CMS outlines a plan in which some of a hospital's Medicare funding would be tied to its HCAHPS performance. The plan, proposed to be implemented this year, is awaiting approval from Congress.

Move toward transparency

The transparency in public reporting involved in the HCAHPS process is, says Roper, essential in achieving quality. Last September, Roper spoke before the Senate Finance Committee on behalf of the National Quality Forum (NQF), of which he is chairman of the board of directors. The NQF promotes change through the development and implementation of a national strategy for health care quality measurement and reporting. "Quality doesn't happen in a vacuum and cannot be accomplished alone," he said. "To truly be successful, all parts of a healthcare system—providers, insurers, health plans, purchasers, consumers and government agencies—must be committed to quality care and agree to conduct measurement, report the results publicly, take action to improve and evaluate and make mid-course corrections. Transparency is a catalyst for creating an environment that encourages and rewards excellence."

This belief has begun to permeate the culture at UNC Health Care. "We're doing a better job of documenting that we are providing the right care at the right time in accordance with the best medical evidence—things like the data that Medicare collects in

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Publicly Reported Clinical Data on the Web

The internet is home to several sources of publicly reported, comparative clinical data. Hospitals across the state and across the nation are required to supply clinical performance data to the Joint Commission on Accreditation of Health Care Organizations (JCAHO) and to the Centers for Medicare and Medicaid Services (CMS). These data are available in a number of formats from different Web pages. Below is a listing of three Web sites, along with brief descriptions of the type of information that can be found on each site.

CMS: Hospital Compare (www.hospitalcompare.hhs.gov)
This Web site provides comparative data for every hospital in the country. You can select hospitals by name, proximity, or geographic region. This site provides comparative graphs of individual process measurements as well as 30-day mortality data for recently discharged Medicare patients.

JCAHO: Quality Check (www.qualitycheck.org/consumer/searchQCR.aspx)
This Web site provides similar information to Hospital Compare but instead of presenting individual measures as the main data format, measures are grouped by diagnostic category and hospitals are assigned an overall "grade" based on their individual scores. After looking at the overall grade, one can click on the diagnostic category to see the individual measures. This website only includes JCAHO-accredited hospitals.

NC Center for Hospital Quality and Patient Safety: NC Hospital Quality Report (www.nchospitalquality.org)
This Web site provides information on all North Carolina Hospitals. This site is different from the other two in that users have greater flexibility in what information they see and how it is presented. Users can easily build comparative reports that show measures in either table or chart format It is easy to navigate and very user-friendly.

When the joy of cooking is more about the people served than the food

Michael Goy surveys the pantry shelves at the homeless shelter for men in downtown Chapel Hill. He heads a cooking team that for the past 16 years has prepared meals each month at the shelter.

Photographs by Dan Sears

One of the first things Michael Goy tried to do after joining the Carolina faculty in 1988 was get a cooking slot at the shelter for homeless men on Rosemary Street. It might have been easier to land tickets to a Carolina-Duke men's basketball game.

"Chapel Hill and Carrboro are so full of Good Samaritans, it took me four years to ever get a chance," said Goy, who is a professor in the Department of Cell and Molecular Physiology in the UNC School of Medicine.

Maybe that is why, once Goy got his cooking slot in 1992, he still has it 16 years later. And it is not just any cooking slot. On the third Sunday of every month, Goy leads the production of a seven-course meal, prepared by hand and made from scratch except for the cakes that Harris Teeter sometimes donates.

Early Saturday morning Goy and several other people lead "a reconnaissance mission" to the shelter pantry to see what food items are available so that the next day's feast will be a thrifty one.

"I take it as a personal challenge to cook what's there in the pantry," Goy said.

That said, he and two other volunteers hit the grocery store to fill the gaps—most often to buy needed spices and fresh vegetables. The three split the costs, which usually do not exceed $30.

They start cooking at 4 p.m. Sunday to have dinner ready for 100 people by 6:15 p.m. Optimally there are six to eight cooks, but many Sundays there are more.

"There is that line about 'too many cooks spoil the broth' and there is some truth to that," Goy said. "We have never turned out a bad meal because we had too many cooks, but there is more fun when there are an appropriate number there because everybody stays busy with something to do."

Over the years, they have learned that the familiar beats the exotic and they try to cook to what Goy called "the common palate." He recalled the disastrous goat-cheese tortellini cooking in a white sauce that tasted good, but looked weird. "That was the least successful meal we've made," he said. In fact, local farmers hauled it away in buckets to slop their pigs.

Faith in people

What has kept him going all these years, in part, is a strong sense of obligation. "I do have a love for people and empathy for people, and I feel a lot of empathy for people who are down on their luck."

Goy said it is not religious faith that drives him, but a faith in people.

"I just feel people deserve an equal foundation in life and I have faith if you give a person a strong foundation you will bring out the best in them," he said. "I am embarrassed to live in a society where people go without basic needs, which I see as food, shelter, health care and education."

Admittedly, he sometimes struggles with what it means to really help somebody. The fact that today he sees many of the same faces in the food line at the shelter that he saw 16 years ago sometimes gives him pause.

He has heard the arguments that giving too much help can foster helplessness and cause people to lose the drive to take care of themselves. Goy, however, believes that most people are homeless because of social forces beyond their control rather than laziness or personal failings.

"The worry I have is the degree to which the help we offer takes away a person's sense of self-respect," he said. "Even so, I just feel more comfortable living in a society where there is a safety net.

He has always been uncomfortable giving money to panhandlers, suspecting that the money they say they need for food is often used for the very things—alcohol or drugs—that led to their homelessness and perpetuates it. When someone holds out the tin cup to him, Goy instead offers to take the person to the homeless shelter for a meal.

Creating a bond

Another part of what keeps him going is the emotional reward and sense of purpose the workers share. Over the years, some 40 people have taken their turn with Goy on the serving line, which has led to a camaraderie.

"This has been a remarkable group of people," Goy said. "So many of them stick with it for so long because of what they get back from the experience. This is not just altruistic stuff. It is genuine fun and it always has been, no matter what the configuration of people.

"We laugh, we joke, we troubleshoot to solve cooking problems and we become friends. We do not know each other outside the group, but during those two-and-a-half hours we are together each month, there is a bond and a friendship between us."

The people they serve are harder to get to know. They move through the line, and then head to a nearby table to eat while the volunteers continue serving. Afterward, they leave while the volunteers stay behind to

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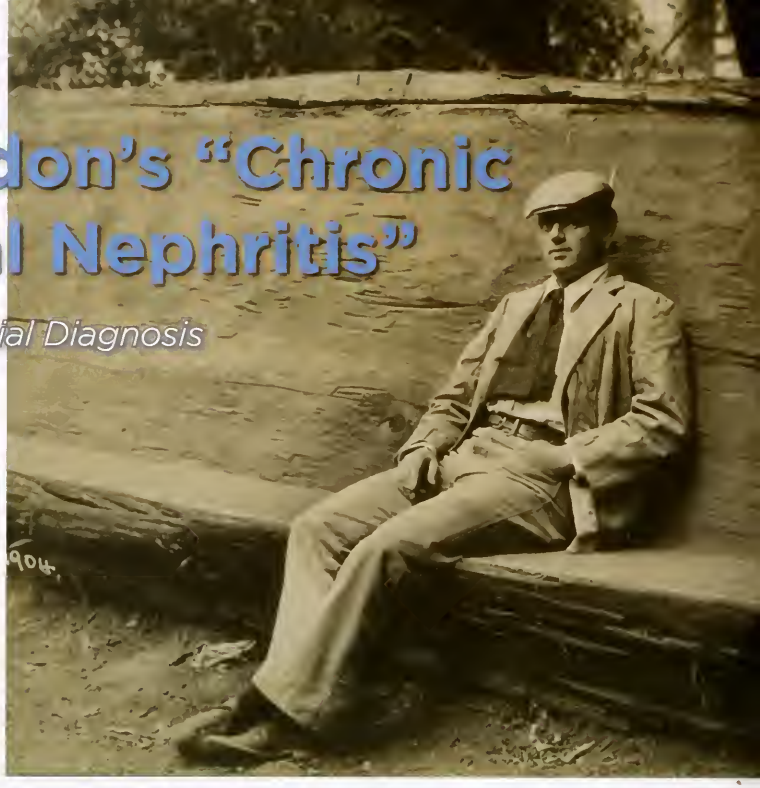
Jack London's "Chronic Interstitial Nephritis"

A Historical Differential Diagnosis



BY ANDREW S. BOMBACK, MD
AND PHILIP J. KLEMMER, MD

Dr. Bomback is the Doris J. Thurston Fellow in the Department of Medicine, Division of Nephrology and Hypertension at the UNC School of Medicine. Dr. Klemmer is professor of medicine in the Division of Nephrology and Hypertension at the UNC School of Medicine.

Jack London, once America's most famous author thanks to *The Call of the Wild*, *White Fang*, and more than 50 other books, died at the age of 40 on November 22, 1916. His death certificate, signed by Dr. William S. Porter, London's personal physician, pronounced "1+ days" of "uraemia following renal colic" as the cause of death. "Chronic interstitial nephritis" of three years' duration was listed as a "contributor."[1] A physicians' bulletin, signed by Porter and three other physicians, described a day-long battle with "a gastro-intestinal type of uraemia" that began after dinner on November 21, 1916, and led to "coma" and then eventual death at 7:45 pm the following evening.[2]

The renal failure documented on London's death certificate has never been fully explained.[3] Speculation that recurrent nephrolithiasis was the source of his kidney disease is rooted in London's persistent renal colic, but the most severe scarring from kidney stones only rarely leads to end-stage renal disease in patients with two functional kidneys.

London's writing was intensely autobiographical and has helped scholars unearth a detailed and fascinating history of a writer, husband, father, sailor, rancher, gold prospector, and social activist (to name a few of the hats he wore to varying degrees of success). We believe that London's words also hold the key to understanding the pathophysiology behind his fatal kidney disease.

1911—Onset of symptomatic uremia

In 1911, Jack London was turned down as a bad health risk by an insurance company. No reason was given for his failure to pass the insurance company's evaluation, but two years later, following an appendectomy, London was told by his surgeon—the same Dr. Porter who eventually took on London as a private patient—that his kidneys were failing. Porter's assessment of London's failing kidneys was probably based on the combination of a normocytic anemia, acidemia, and heavy albuminuria, diagnostic tests readily available for a physician in 1913.[4] London's letters and his second wife's diary relate Porter's warning that he would die of kidney failure if he did not stop drinking, give up raw fish and meat, and start exercising and losing weight. By most reports, the writer wasn't a particularly compliant patient.[5,6] Photographs from London's final years show him bloated with edema. His behavior became more erratic, and his writing, too, showed signs of deterioration.[7] His body and mind were shutting down as uremia took its toll.

London's life story provides the basis for a broad

differential diagnosis of a chronic kidney disease that progressed to end-stage renal disease. The author was almost as famous for his drinking exploits as for his adventure stories of the Klondike and the South Seas, thanks to the thinly-veiled, alcohol-soaked autobiographical protagonists of novels such as *Martin Eden* and *John Barleycorn*. Although glomerular morphologic abnormalities with IgA deposition are found in more than fifty percent of cirrhotic patients at either necropsy or biopsy[8,9] (presumably due to defective hepatic processing or portacaval shunting of circulating immune complexes[10]), these abnormalities do not cause proteinuria or renal scarring. End-stage liver disease and its associated hemodynamic compromise can lead to renal dysfunction and, in some, hepatorenal syndrome. London, however, never displayed classic signs of liver failure such as encephalopathy, jaundice, pruritus, or asterixis, and the same physicians who detected his kidney disease should have been able to diagnose cirrhosis.

London's celebrated nickname, "Wolf," was rooted in the love for these animals he revealed in classics such as *The Call of the Wild* and *White Fang*. A recent report argues that this literary "Wolf" might have suffered from systemic lupus erythematosus (SLE),[11] a disease named for the facial rash of untreated victims suggesting the ravages of a wolf bite. The argument focuses on four criteria for the diagnosis of SLE that London supposedly displayed during his lifetime: oral ulcerations, arthritis, photosensitivity, and renal disease. However, a bout of scurvy that London endured in the Klondike provides an equally strong etiology for his oral ulcerations, and the distribution of his "arthritis" is more reflective of a case of gout likely exacerbated by the author's steady diet of raw meat and alcohol. The author's assertion that "All my life my skin ha[s] been famous for its healing powers"[12p.93] is not consistent with the photosensitive cutaneous lupus. And while there are a number of different types of renal disease in SLE, with immune complex-mediated glomerular diseases being most common, there is another, more compelling, unifying diagnosis for both London's kidney failure and transitory dermatitis.

Sick while cruising on the *Snark*

In 1907, accompanied by his second wife, Charmian, and two crew members, Jack London set out from San Francisco aboard the *Snark*, a custom-made schooner built to sail around the world. Their one-and-a-half-year voyage (chronicled in *The Cruise of the Snark*) instead became an intense exploration of the South Pacific that ended in an Australian hospital where London was treated for a "mysterious malady that ... extended from my hands to my feet so that at times I was as helpless as a child."[12p208] Prior to contracting this illness, London had correctly self-diagnosed himself with a severe case of yaws, an infectious, nonvenereal disease caused by *Treponema pallidum pertenue*, a subspecies of the spirochete responsible for syphilis. London believed he had caught the "vile skin disease"[12p194] from a French sailor he picked up in Tahiti. Whether true or not, the *Snark's* voyage certainly put him and his crew (all of whom contracted the disease) in an area where yaws was endemic. Before the World Health Organization's mass treatment campaigns began in the 1950s, the worldwide prevalence of yaws was between fifty and one hundred million, with the warm and humid tropical regions of Southeast Asia and the Pacific Islands two of the rifest areas.[13]

While there are no reports of renal complications from yaws, London's choice of treatment for the skin condition in the pre-antibiotic era clearly put his kidneys at risk.

> *Here were malignant and excessively active ulcers that were eating me up. There was an organic and corroding poison at work. ... I decided to fight the poison with corrosive sublimate. The very name of it struck me as vicious. Talk of fighting fire with fire! I was being consumed by a corrosive poison, and it appealed to my fancy to fight it with another corrosive poison.*[12p96]

Corrosive sublimate (mercuric chloride) was then considered one of the few existing therapies for yaws, along with arsenic and potassium iodide. However, the correct dosing and duration of use for these substances

Bancroft Library

1 PLACE OF DEATH

COUNTY OF SONOMA

TOWN OF Glen Ellen OR

CITY OF (No.) ST.; WARD)

California State Board of Health

BUREAU OF VITAL STATISTICS

STANDARD CERTIFICATE OF DEATH

State Index No.

Local Registered No. 345

[If death occurred in a hospital or institution, give its NAME instead of street and number, and fill out Nos. 18A and 18B.]

2 Full Name Jack London

PERSONAL AND STATISTICAL PARTICULARS

3 SEX: male

4 COLOR OR RACE: white

5 ~~SINGLE~~ MARRIED, ~~WIDOWED, OR DIVORCED~~ (Write the word): married

5a HUSBAND OF: Charmian K. London

5b WIFE OF:

6 DATE OF BIRTH: January 12th 1876 (Month) (Day) (Year)

7 AGE: 40 years 11 months 20 days; If LESS than 1 day, hrs or min.

8 OCCUPATION (a) Trade, profession or particular kind of work: Author

(b) General nature of industry, business, or establishment in which employed (or employer):

9 BIRTHPLACE (State or country): San Francisco

PARENTS

10 NAME OF FATHER: John London

11 BIRTHPLACE OF FATHER (State or country): Pennsylvania

12 MAIDEN NAME OF MOTHER: Flora Wellman

13 BIRTHPLACE OF MOTHER (State or country): Ohio

18a LENGTH OF RESIDENCE

At Place of Death (Primary registration district): 10 years — months — days

In California: — years — months — days

14 THE ABOVE IS TRUE TO THE BEST OF MY KNOWLEDGE

(Informant): Eliza Shepard

(Address): Glen Ellen, Sonoma Co

15 Filed Nov 23, 1916 N. W. Gottenberg Subregistrar

Filed Dec 1, 1916 R. G. Hagle Registrar or Deputy

MEDICAL CERTIFICATE OF DEATH

16 DATE OF DEATH: November 22, 1916 (Month) (Day) (Year)

17 I HEREBY CERTIFY, That I attended deceased from July, 1913, to Nov 22, 1916; that I last saw him alive on Nov 22nd 1916; and that death occurred on the date stated above at 7:45 P. M.

The CAUSE OF DEATH * was as follows:

Uraemia following renal Sclerosis

(Duration) years months 1st days

Contributory Chronic Interstitial Nephritis

(Duration) 3 years — months — days

State whether attributed to dangerous or insanitary conditions of employment: No

(Signed) William F. Porter, M. D.

Nov 22 1916. (Address) Oakland

*State the DISEASE CAUSING DEATH, or, in deaths from VIOLENT CAUSES, state (1) MEANS OF INJURY; and (2) whether (probably) ACCIDENTAL, SUICIDAL, or HOMICIDAL.

18b SPECIAL INFORMATION FOR HOSPITALS, INSTITUTIONS, TRANSIENTS OR RECENT RESIDENTS

Where was disease contracted, if not at place of death?

Former or usual residence

19 PLACE OF BURIAL OR REMOVAL: Oakland 15th St

DATE OF BURIAL: 24th at Nov, 1916

20 UNDERTAKER: N. F. Bates

ADDRESS: Sonoma

Bancroft Library, University of California at Berkeley

were not adequately established, and their potential toxicities were often unrecognized. Unfortunately, "poison" was an apt word for London to choose in describing corrosive sublimate. Mercury in any form is toxic; poisoning can result from vapor inhalation, ingestion, injection, or absorption through the skin. Neurological, gastrointestinal, and renal systems are the most commonly affected organ systems in mercury exposure.

Heavy metal treatment—and toxicity for yaws

Inorganic mercury salts such as mercuric chloride are highly noxious. Their poor lipid solubility results in a nonuniform distribution, with accumulation primarily in the proximal renal tubules, where it predisposes to proteinuria, granular casts in the urinary sediment, nephrotic syndrome, and pyuria from tubular damage. In some cases, renal failure with severe oliguria and anuria may occur.[14] London, who had treated himself with mercury for gonorrhea as early as 1902,[5] wholeheartedly embraced mercuric chloride and, touting himself as an "amateur M.D.,"[12p191] offered to "mix up some corrosive sublimate"[12p196] for all aboard the *Snark*. Charmian London's diary of the voyage suggests that her husband used corrosive sublimate for five months, from June through November 1908, until he returned to California with his yaws lesions healed.[15] The heavy load of mercury London self-administered at the end of his *Snark* voyage likely caused an acute proximal tubular necrosis that was not entirely reversible. Over the next eight years, his

gradually declining kidney function, which today might be attenuated by ACE-inhibitors and dietary protein restriction, led to his end-stage renal disease.

Mercury toxicity also explains the "mysterious malady" that London claims baffled a team of expert physicians in Australia.

> *The mysterious malady that afflicted my hands was too much for the Australian specialists. It was unknown in the literature of medicine. No case like it had ever been reported. . . On occasion my hands were twice their natural size, with seven dead and dying skins peeling off at the same time. There were times when my toe-nails, in twenty-four hours, grew as thick as they were long.*[4,6,9]

Dermal contact with mercuric chloride can cause hair loss, irritability, insomnia, diaphoresis, acrodynia (painful extremities, most often seen in children chronically exposed to heavy metals), and severe dermatitis with swelling and irritation of the hands, feet, cheeks, and nose. When the Australian physicians told London "that the malady was non-parasitic, and that, therefore, it must be nervous,"[4,6,9] they may have been diagnosing the mercury-associated neurological effects—tremors, sensory and motor deficits, emotional lability—that were famously documented in mercury poisoning cases in the hatting and furring industries, whose primary route of exposure was inhalation of mercuric nitrate.[16] Although corrosive sublimate's poor lipid solubility limits penetration beyond the blood-brain barrier, slow elimination and chronic exposure could have allowed for significant central nervous system accumulation of inorganic mercury and subsequent neurotoxicity.[17]

Case solved?

The official biography of Jack London at the Huntington Library, which houses the author's personal archive, concludes that "his death has still not been satisfactorily explained."[18] This is in part due to a controversy begun in 1938 when Irving Stone published *Jack London, Sailor on Horseback*.[19] Stone's book, subtitled *A Biographical Novel*, posited that London deliberately took a lethal dose of morphine, and that his death was from a narcotics overdose rather than from renal failure. Stone claimed that London's personal physician and his wife, Charmian, insisted on listing uremia as the cause of death to avoid an inquest and autopsy.

If Jack London did, in fact, cause his own death with a self-administered toxin, the fatal medication was almost certainly not morphine, which he had been using for at least three years for renal colic. His tolerance for this narcotic would have made a calculated overdose nearly impossible and undoubtedly would have required more than the amount found in his bedroom at the time of his death.[4,6] The poison in London's case may have been the agent causing the "uraemia" from "chronic interstitial nephritis" listed on his death certificate, the agent that London presciently called a "corrosive poison" upon his first use: mercury.

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UNC scientists turn human skin cells into insulin-producing cells

Researchers at the UNC School of Medicine have transformed cells from human skin into cells that produce insulin, the hormone used to treat diabetes.

The breakthrough may one day lead to new treatments or even a cure for the millions of people affected by the disease, researchers say.

The approach involves reprogramming skin cells into pluripotent stem cells, or cells that can give rise to any other fetal or adult cell type, and then inducing them to differentiate, or transform, into cells that perform a particular function—in this case, secreting insulin.

Several recent studies have shown that cells can be returned to pluripotent state using "defined factors" (specific proteins that control which genes are active in a cell), a technique pioneered by Dr. Shinya Yamanaka, a professor at Kyoto University in Japan.

However, the UNC study is the first to demonstrate that cells reprogrammed in this way can be coaxed to differentiate into insulin-secreting cells. Results of the study are published online in the *Journal of Biological Chemistry*.

"Not only have we shown that we can reprogram skin cells, but we have also demonstrated that these reprogrammed cells can be differentiated into insulin-producing cells which hold great therapeutic potential for diabetes," said study lead author Yi Zhang, PhD, Howard Hughes Medical Institute investigator, professor of biochemistry and biophysics at UNC and member of the Lineberger Comprehensive Cancer Center.

"Of course, there are many years of additional studies that are required first, but this study provides hope for a cure for all patients with diabetes," said John Buse, MD, PhD, president of the American Diabetes Association and professor and chief of the endocrinology division in the UNC School of Medicine's Department of Medicine.

About 24 million Americans suffer from diabetes, a disease that occurs when the body is unable to produce or use insulin properly. Virtually all patients with type I diabetes, the more severe of the two types, must rely on daily injections of insulin to maintain their blood sugar levels.

Recent research exploring a possible long-term treatment—the transplantation of insulin-producing beta cells into patients—has yielded promising results. But this approach faces its own challenges, given the extreme shortage of matched organ donors and the need to suppress patients' immune systems.

The work by Zhang and other researchers could potentially address those problems, since insulin-producing cells could be made from diabetic patients' own reprogrammed cells.

Zhang is collaborating with Buse to obtain skin samples from diabetes patients. He said he hoped his current experiments will take this approach one step closer to a new treatment or even a cure for diabetes.

The research was funded by the Howard Hughes Medical Institute and the National Institutes of Health. Study co-authors include postdoctoral fellows Keisuke Tateishi, MD; Jin He, PhD; Olena Taranova, PhD; Ana C. D'Alessio, PhD; and graduate student Gaoyang Liang, all from the UNC School of Medicine's Department of Biochemistry and Biophysics.

Shared survival mechanism explains why 'good' nerve cells last and 'bad' cancer cells flourish

Cancer cells and nervous system neurons may not look or act alike, but both use strikingly similar ways to survive, according to new research from the UNC School of Medicine.

The study published in the December 2008 issue of *Nature Cell Biology* is the first to describe how neurons (nerve cells) and cancer cells achieve the common goal of inhibiting the series of biochemical events called apoptosis that eventually causes cells to break down and die.

That's good in the case of neurons, but bad when it comes to cancer.

"In neurons, inhibiting cell death is physiologically important to ensuring their long term survival," said the study's lead author, neurobiologist Mohanish Deshmukh, PhD, associate professor of cell and developmental biology and member of the Lineberger Comprehensive Cancer Center and the UNC Neuroscience Center. "In cancer cells, blocking cell death allows them to evade the host defense systems and proliferate uncontrollably."

Both neurons and cancer cells do have something in common: relying extensively on the metabolism of glucose, a simple sugar. But until now, the advantages of this common characteristic have remained unclear.

"One reason why these results are so interesting is that neurons and cancer cells are as different from each other as you can imagine. For example, cancer cells divide continuously, whereas neurons don't divide at all," Deshmukh said.

In their research, Deshmukh and UNC graduate student Allyson Vaughn (currently a postdoctoral scientist at MIT) found that to prevent death, neurons and cancer cells use a specific metabolic pathway, or series of chemical reactions. This pathway—the pentose phosphate biochemical pathway—inhibits the activation of a key protein involved in the process of cell death called cytochrome c. "What we show is that both neurons and cancer cells inhibit the cell death process mediated by cytochrome c," Deshmukh said.

Specifically, according to the study, cytochrome c's ability to induce death can be turned off if the cellular environment contains high levels of antioxidants. Healthy neurons and cancer cells have increased levels of the antioxidant glutathione (GSH), which is generated by glucose metabolism through the pentose phosphate pathway. Thus, both neurons and cancer cells are able to resist cell death in part via their reliance on glucose

metabolism.

"For neurons and cancer cells, evolution has come up with ways to restrict the cell death pathway. Our results provide insight into the mechanism behind this adaptive advantage," Deshmukh said. "They also bring together the fields of cancer and neurobiology and suggest that the mechanisms used by neurons to evade cell death could be the same ones adapted by dividing cells during their progression toward cancer."

The UNC scientist said his lab's further systematic explorations for other similarities between these cell types may offer insights into turning the cell death process back on in cancer cells.

The study was supported by the National Institutes of Health and the University Cancer Research Fund.

UNC researchers find clue to stopping breast cancer metastasis

If scientists knew exactly what a breast cancer cell needs to spread, then they could stop the most deadly part of the disease: metastasis. New research from the UNC School of Medicine takes a step in that direction.

Carol Otey, PhD, and UNC colleagues reduced the ability of breast cancer cells to migrate by knocking down the expression of a protein called palladin.

They also found higher levels of palladin in four invasive breast cancer cell lines compared to four non-invasive cell lines.

"This study shows that palladin may play an important role in the metastasis of breast cancer cells as they move out of the tumor and into the blood vessels and lymphatics to spread throughout the body," said Otey, associate professor of cell and molecular physiology.

To conduct the study, the researchers grew breast cancer cells in an "invasion chamber," in which human tumor cells are placed in a plastic well that is inserted into a larger well. Cells will attempt to move to the bottom of the chamber because it's baited with growth factors that cells find attractive. But first the cells have to migrate through a filter coated with a layer of artificial connective tissue. "The cells have to migrate through that and have to degrade it," Otey said. "It's a useful model system that mimics what happens in the body."

The study results appeared in the November 3 online edition of the journal *Oncogene*.

Most women would never die from breast cancer if the cancer cells couldn't metastasize to the brain and bone marrow, Otey said. "To really make breast cancer a treatable disease, we have to be able to find a way to prevent or reduce the amount of metastasis."

"Now that we see palladin is expressed mostly in invasive cells, it raises the question as to whether it might be useful as a prognostic marker," Otey said. "Maybe someday doctors could test for the presence of palladin to identify patients who have the most aggressive tumors, then give those patients personalized, more aggressive treatment."

The study benefited from the collaboration between Otey's cell and molecular physiology lab and Dr. Hong-Jin "H.J." Kim's surgical oncology lab. "I learned a lot from H.J. about the challenges that clinicians face as they try to optimize the treatment of each breast cancer patient," Otey said.

Otey has been investigating palladin's role in cell movement since she discovered and named it in 2000.

Next she will examine a variety of samples of human tumors from a UNC tumor bank, to find out if the tumors from patients who had worse outcomes and more aggressive cancers contain higher levels of palladin.

In addition to Otey and Kim, the study co-authors—all from UNC—are Silvia M. Goicoechea, PhD, research instructor, and Hannah Prentice-Dunn, undergraduate student, both of the Department of Cell and Molecular Physiology; Brian Bednarski, MD, assistant professor of surgery; and Rafael Garcia-Mata, PhD, research assistant professor in the Department of Cell and Developmental Biology.

The work was funded by the National Institutes of Health.

UNC scientists, research network, unveil results from groundbreaking brain tumor study

A nationwide team of scientists, including researchers at the UNC's Lineberger Comprehensive Cancer Center, have reported the first results of a large-scale, comprehensive study of the most common form of brain cancer, glioblastoma.

The findings from the study—conducted by the Cancer Genome Atlas Research Network, a collaborative effort involving 10 institutions and organizations across the country—appeared in the online September 4 edition of the journal *Nature*. The network is funded by the National Cancer Institute and the National Human Genome Research Institute of the National Institutes of Health.

The paper describes the discovery of new genetic mutations and other types of DNA alterations that have potential implications for the diagnosis and treatment of glioblastoma.

More than 21,000 people are estimated to develop brain cancer in the United States each year, and more than 13,000 people will die from the disease. Glioblastoma, the type of brain cancer most often found in adults, is a very fast-growing type of tumor. Most patients die within about 14 months of diagnosis.

Scientists discovered three previously unrecognized genetic mutations that occur with significant frequency and made an unexpected observation that points to a potential mechanism of resistance to a commonly used drug used to treat brain cancer.

The researchers also identified and mapped major protein-interaction pathways that are disrupted in this type of brain

cancer. They said that the pathway mapping promises to be particularly informative for scientists developing therapeutic strategies aimed more precisely at specific cancers, or that are better tailored to each patient's particular tumor subtype.

The network's members analyzed 206 complete sets of DNA, or genomes, of tumor samples donated by patients with glioblastoma. Each affiliate performed unique genomic assays, which were then combined together to yield new insights. Lineberger scientists Charles Perou, PhD, Michael Topal, PhD, and Neil Hayes, MD, performed the genomic, or so-called gene expression assays on the samples. This analysis identified which genes are expressed, or "on," an important step in identifying the genes linked to brain cancer.

The combined efforts created an unparalleled look at the events that cause glioblastoma tumors to develop, researchers said.

"The ability to look at all genes at once with so many different approaches has never been done before, and the picture painted by this massive data is so rich that it will take us many years to understand fully the data we have collected," said Perou, also associate professor in the departments of Genetics and of Pathology and Laboratory Medicine in the School of Medicine. "This is a very big step towards a comprehensive analysis of the brain cancer genome, which we hope will make an impact upon patient care and improve outcomes."

Hayes, assistant professor in the hematology and oncology division in the School of Medicine's Department of medicine, said that the collaborative nature of the study would make it possible to detect far more complicated interactions between the genetic events that initiate and spread tumors. "Since these events are different in different patients, it is a real step towards designing personalized therapies," he said

Topal, also a professor in the departments of Pathology and Biochemistry and Biophysics in the School of Medicine, said: "The role being played by UNC scientists and core facilities in this groundbreaking cancer study speaks volumes about the wonderful investment being made in cancer research by the people of North Carolina."

UNC's chief of neurosurgery and the leader of Lineberger's neuro-oncology program, Matthew Ewend, MD, said there is great promise in the network's approach.

"The glioblastoma remains one of the most significant challenges in cancer therapy," he said. "The tumor attacks the brain, and has been resistant to many therapies that have had success in treating cancer elsewhere in the body. This important work looks to unlock the secrets of resistance hidden inside the genes of the glioblastoma, and then use these discoveries to develop treatments that attack the weaknesses of the tumor. It's crucial work that has many positive benefits for our patients."

The work detailed in the *Nature* article complements and expands upon a parallel study by John Hopkins researchers of 22 glioblastoma tumors, also published last September in the journal *Science*.

The lead authors of the paper were Lynda Chin, MD, and Matthew Meyerson, MD, PhD, of Dana-Farber Cancer Institute and Harvard Medical School, Boston. Meyerson is also affiliated with the Broad Institute of MIT and Harvard, Cambridge, Mass.

UNC study: cell protein suppresses pain eight times more effectively than morphine

More people suffer from pain than from heart disease, diabetes and cancer combined, but many of the drugs used to relieve suffering are not completely effective or have harmful side effects.

Now researchers at the UNC School of Medicine and the University of Helsinki have discovered a new therapeutic target for pain control, one that appears to be eight times more effective at suppressing pain than morphine.

The scientists pinpointed the identity and role of a particular protein that acts in pain-sensing neurons, or nerve cells, to convert the chemical messengers that cause pain into ones that suppress it.

"This protein has the potential to be a groundbreaking treatment for pain and has previously not been studied in pain-sensing neurons," said lead study author Mark J. Zylka, PhD, assistant professor of cell and molecular physiology at UNC. The results of the study were published online in the journal *Neuron* in October.

The biological basis of pain is complex. To study the transmission of painful signals throughout the body, many researchers use "marker" proteins that label pain-sensing neurons. One such marker, FRAP (fluoride-resistant acid phosphatase), has been employed for this purpose for nearly 50 years, but the gene that codes for its production was never identified.

That is, until researchers at UNC found that FRAP is identical to PAP (prostatic acid phosphatase), a protein routinely used to diagnose prostate cancer whose levels increase in the blood of patients with metastatic prostate cancer.

Previous research hinted that FRAP and PAP may have a shared identity. To determine whether or not this was the case, Zylka teamed up with Dr. Pirkko Vihko, a professor from the University of Helsinki who had genetically engineered mice that were missing the gene for PAP. When Zylka and his colleagues studied tissues from these mutant mice, they were happy to see that FRAP activity was missing. This revealed that the two proteins were in fact identical

Further, the mutant mice proved more sensitive than normal mice to inflammatory pain and neuropathic pain, two

common forms of chronic pain in humans. These increased sensitivities diminished when researchers injected excess amounts of PAP into the spinal cords of the mutant mice.

"We were really blown away that a simple injection could have such a potent effect on pain," Zylka said. "Not only that, but it appeared to work much better than the commonly used drug morphine."

The new protein suppressed pain as effectively as morphine but for substantially longer. One dose of PAP lasted for up to three days, much longer than the five hours gained with a single dose of morphine.

The next question for the researchers was how PAP suppressed pain. It is already known that when pain-sensing neurons are stimulated, they release chemicals known as nucleotides, specifically adenosine triphosphate (ATP). This in turn sets off the events that invoke a painful sensation. But if ATP degrades to adenosine, that inhibits the neurons that transmit pain signals, thus relieving pain. Through a series of experiments, the UNC researchers showed that PAP removes the phosphate group, generating adenosine. Their study is the first to identify and characterize the role of such a protein in pain-sensing neurons.

Zylka and his colleagues are now searching for additional proteins that degrade nucleotides in these neurons. They are also working to develop small molecules that interact with PAP to enhance or mimic its activity.

"It is entirely possible that PAP itself could be used as a treatment for pain, through an injection just like morphine," Zylka said. "But we would like to modify it to be taken in pill form. By taking this field in a new direction, we are encouraged and hopeful that we will be able to devise new treatments for pain."

The research undertaken at UNC was supported by grants from the Sloan Foundation, the Searle Scholars Program, the Klingenstein Foundation, the Whitehall Foundation, the Rita Allen Foundation and the National Institute of Neurological Disorders and Stroke, part of the National Institutes of Health. The research undertaken at the University of Helsinki was supported by grants from the Sigrid Jusélius Foundation, the Finnish Cancer Foundation and the Research Council for Medicine of the Academy of Finland.

Study co-authors include graduate student Nathaniel A. Sowa, research analyst Bonnie Taylor-Blake and research technician Margaret A. Twomey from UNC; and postdoctoral researchers Annakaisa Herrala and Vootele Võikar from the University of Helsinki.

UNC study supports role of circadian clock in response to chemotherapy

For years, research has hinted that the time of day that cancer patients receive chemotherapy can impact their chances of survival. But the lack of a clear scientific explanation for this finding has kept clinicians from considering timing as a factor in treatment.

Now, a new study from UNC has suggested that treatment is most effective at certain times of day because that is when a particular enzyme system—one that can reverse the actions of chemotherapeutic drugs—is at its lowest level in the body.

The study, performed in mice, could also have implications for the prevention of new cancers.

The enzyme system implicated—called nucleotide excision repair—repairs many types of DNA damage that come not just from chemotherapy but also from the ultraviolet rays of the sun. Thus, by understanding the cyclical nature of this system, physicians may be able to pinpoint when it is most critical for people to protect themselves from sun exposure to minimize their risk of skin cancer.

Timing is everything, and here we have molecular data showing why this is especially true with regard to cancer," said senior study author Aziz Sancar, MD, PhD, a member of the UNC Lineberger Comprehensive Cancer Center and Sarah Graham Kenan Professor of Biochemistry and Biophysics in the UNC School of Medicine. Sancar is also a member of the National Academy of Sciences and the Turkish Academy of Sciences. "By hitting cancer cells with chemo at a time when their ability to repair themselves is minimal, you should be able to maximize effectiveness and minimize side effects of treatment."

The study, which appeared in the January 2nd edition of *Proceedings of the National Academy of Sciences*, provides the first solid evidence that the daily oscillations in the cell's repair machinery can affect the potency of cancer drugs.

The primary driver of this oscillatory behavior is the circadian clock, which keeps the biochemical, behavioral and physiological processes of many organisms, including those of humans, on a 24-hour cycle. Every single cell in the body—whether from the kidney, liver or heart—has its own internal clock, and each of these are synchronized and coordinated by one master clock, located in a particular cluster of neurons in the brain.

Because of the important role that the circadian clock plays in regulating the daily rhythms of life, Sancar wanted to see what influence it had on important functions in the body, in particular the repair of damage to DNA caused by chemotherapy or UV radiation. This damage is usually repaired by a process called nucleotide excision repair, which cuts out and replaces sections of damaged DNA.

Sancar and his colleagues studied the behavior of the repair machinery in cerebrum or brain tissue of mice over the course of a day, and found that the ability to repair damage was at a minimum in the early morning and maximum in the evening hour. They then looked at each of the components that make up the repair machinery and found that the levels of one of them—the protein XPA—remained steady throughout the oscillations of the other components. Thus, the researchers demonstrated that the ability to repair damage is linked to the circadian clock, and that the most vulnerable time, ultimately, is in the early morning.

particular enzyme at different times of day.

Sancar now wants to extend these studies to determine whether the same cyclical changes in repair activity seen in mouse brain can also be observed in mouse testis. This avenue is particularly relevant because cisplatin—a chemotherapeutic agent commonly used to treat testicular cancer—kills cancer cells by damaging DNA.

While cisplatin is considered by many people to be a miracle drug—one in ten patients who take it still do not survive and it is not as effective on other cancers, such as colon, ovarian and lung cancers. Sancar said he believes that identifying the times when the cancer cells' ability to repair damage is at a minimum may enable clinicians to tailor treatment and improve the survival rate for people with testicular cancer and these other more common cancers as well.

He also would like to see his findings being used for cancer prevention. Because the enzyme Sancar identified also repairs damage caused by sunlight, he plans to determine if the repair capacity in human skin changes as a function of the time of day.

"If we show the same patterns in humans as we did in mice, then it could tell us when would be the safest time to be in the sun (2 pm to 6 pm), and when would be the best time to avoid sun exposure (6 am to 10 am)," Sancar said. "The new information could help us prevent skin cancers."

The research was supported by the National Institutes of Health. Study co-authors from UNC Department of Biochemistry and Biophysics include the lead author and postdoctoral scientist Tae-Hong Kang, PhD; senior research associate Joyce T. Reardon; and postdoctoral scientist Michael Kemp, PhD.

Nearly half of US adults will develop painful knee osteoarthritis by age 85: study

Almost half of all US adults and nearly two-thirds of obese adults will develop painful osteoarthritis of the knee by age 85, a study based at UNC suggests.

The study also found that a person's lifetime risk rose as their body mass index or BMI increased, with the greatest risk found in those whose weight was normal at age 18 but were overweight or obese at 45 or older.

"These results show how important weight management is for people throughout their lives," said Dr. Joanne Jordan, principal investigator of the Johnston County Osteoarthritis Project and senior study author. "Simply put, people who keep their weight within the normal range are much less likely to develop symptomatic knee osteoarthritis as they get older and thus much less likely to face the need for major surgical procedures, such as knee replacement surgery."

The study also sends an important message to physicians, said Jordan, director of the Thurston Arthritis Research Center and professor of medicine and orthopaedics in the UNC School of Medicine. "They need to include the risk of knee osteoarthritis in the discussion when counseling patients about weight management and they need to factor that risk into their treatment plans."

The results were published in the September 15 issue of *Arthritis Care & Research*. Lead author of the report is Louise Murphy, PhD, of the Centers for Disease Control and Prevention in Atlanta. Murphy led the data analysis and the CDC is the primary funder of the Johnston County Osteoarthritis Project.

In the study, researchers collected and analyzed data over a 13-year period from 3,068 men and women 45 years old and older who live in Johnston County, NC. At two separate points during the study, each participant was interviewed at home and given a clinical exam that included taking X-ray images of their knees and measuring their BMI. They were interviewed a second time two weeks after the clinical exam. In addition, researchers calculated the subjects' BMI at age 18 based on their self report of height and weight at that age.

After all data were collected, researchers estimated the lifetime risk of symptomatic osteoarthritis in at least one knee using logistic regression models of statistical analysis. They found that the lifetime risk of symptomatic knee osteoarthritis was 44.7 percent.

There were no significant differences in risk related to a participant's sex, race or education level. However, obese participants had a significantly higher lifetime risk, 60.5 percent compared to 30.2 percent for normal weight and 46.9 percent for overweight participants. Those with a history knee injury also had a higher risk than those without, 56.8 percent compared to 42.3 percent.

A separate analysis of BMI across the span of participants' lives found that those who had a normal weight at age 18 and at their baseline and follow up visits had the lowest risk (29.2 percent) while those who reported a normal weight at 18 but were overweight or obese at the two later time points had the highest risk (59.9) percent.

Although the participants in this study all live in the same relatively rural county in the South, the lifetime risk of knee arthritis is likely high in the rest of the US as well, the researchers wrote. They concluded that the study "underscores the need for public health weight loss and management interventions" that would help decrease the risk.

Besides Jordan, UNC authors of the study include Todd A. Schwartz, DrPH, Gary Koch, PhD, and William D. Kalsbeek, PhD, all from the UNC School of Public Health; and Jordan B. Renner, MD, from the School of Medicine.

In addition to Murphy, study authors not at UNC include Charles G. Helmick, MD, of the CDC; Gail Tudor, PhD, of Huston College in Bangor, Maine; Anca Dragomir, PhD, who earned her PhD at UNC but now works at the National Institutes of Health; and Gheorghe Luta, PhD, who also earned his PhD at UNC and is now at Georgetown University Medical Center.

Jacobson, Magnuson named fellows of the American Association for the Advancement of Science

UNC School of Medicine faculty members Kenneth A. Jacobson, PhD, and Terry R. Magnuson, PhD, have been named fellows of the American Association for the Advancement of Science.

Jacobson

The association elects fellows to recognize their scientifically or socially distinguished efforts to advance science or its applications.

Jacobson, a professor in the Department of Cell and Developmental Biology, was honored by the association "for new insights into the domain structure of the living cell membrane and mechanisms of cell motility and for development of technologies to analyze these phenomena." His work focuses on how cell membranes are organized and the physical principles of how cells move.

Magnuson

Magnuson, chairman of the Department of Genetics and Sarah Graham Kenan Professor and director of the Carolina Center for Genome Sciences, was recognized "for sustained and important contributions to mouse developmental genetics, including creating methodologies and strains for wide use, and identifying genes important for embryo development." His work focuses on the role of certain mammal genes in genomic imprinting and X-chromosome inactivation and in tumor suppression.

The two are among 486 scientists awarded the honor this year. The new fellows were presented with an official certificate and a rosette pin at the association's 2009 annual meeting in Chicago in February. Visit the AAAS Web site at http://www.aaas.org/

Pisano elected to National Academy of Sciences' Institute of Medicine

Etta Pisano, MD, vice dean for academic affairs in the UNC School of Medicine, has been elected to the National Academy of Sciences' Institute of Medicine, one of the nation's highest honors for those in the fields of health and medicine.

Pisano is one of 64 new members of the IOM. She joins 1,674 current members of the organization, among them, 16 colleagues at UNC.

Serving as vice dean for academic affairs in the UNC School of Medicine since 2006, Pisano is also Kenan Professor of Radiology and Biomedical Engineering, director of the UNC Biomedical Research Imaging Center and a member of the UNC Lineberger Comprehensive Cancer Center.

Pisano's work has garnered her many awards through the years. In 2002, *Diagnostic Imaging* named her one of the "20 Most Influential People" in radiology and Castle Connolly Medical Ltd. called her one of "America's Top Doctors." She was also named one of America's best breast cancer doctors by *Redbook* in 2001.

In 2006, she was also honored with the Heart Breakthrough Award from Ladies Home Journal for her work as one of the principal investigators in the Digital Mammographic Imaging Screening Trial. That trial showed that digital mammograms are superior to older film mammograms for younger women with denser breast tissue.

Her research has helped lead the push for transition to digital mammography machines across the country.

In addition to her position at UNC, Pisano is also a member of the Radiological Society of North America and the American Roentgen Ray Society. She is also a past-president of the Association of University Radiologists and current chairperson of the American College of Radiology Imaging Network Breast Committee and the International Digital Mammography Development Group.

Election into the IOM is for individuals who have demonstrated outstanding professional achievements and commitment to service. Current members elect new members from among candidates nominated for their accomplishments and contributions to the advancement of the medical sciences, health care and public health.

Miller honored by American Society for Microbiology

The 2009 American Society for Microbiology (ASM) Siemens Healthcare Diagnostics Young Investigator Award was presented to Melissa B. Miller, PhD, D(ABMM), director, Clinical Molecular Microbiology Laboratory, assistant professor, Department of Pathology and Laboratory Medicine, and associate director, Clinical Microbiology-Immunology Laboratory at the UNC School of Medicine. This award recognizes outstanding laboratory research in clinical microbiology or antimicrobial agents.

Miller has contributed significantly to the fields of cystic fibrosis microbiology and detection and epidemiology of MRSA, and is known for her research on the development and application of molecular assays for use in the diagnosis of infectious diseases. She built the molecular infectious disease diagnostic laboratory at UNC that provides molecular detection and identification for over 35 different infectious disease etiologies.

Miller is actively involved in several research collaborations on antimicrobial agents, including methicillin-resistance in Staphylococcus aureus, vancomycin-resistance in enterococcus,

and macrolide-resistance in Streptococcus pyogenes and Streptococcus agalactiae.

Miller received her PhD from Princeton University and completed postdoctoral training at UNC Hospitals in 2004. She currently serves on the Board of the American College of Microbiology.

Piven named editor of new journal

Joseph Piven, MD, has been named editor-in-chief of the newly created *Journal of Neurodevelopmental Disorders*.

Piven is Sarah Graham Kenan professor of psychiatry, pediatrics and psychology and director of the Carolina Institute for Developmental Disabilities at UNC. He has been a member of the UNC faculty for the last eight years.

Piven said he approached Springer Publishing with the idea for the journal after noticing a void in journals currently in the marketplace.

"There is nothing like it in the field," Piven said. "There are journals by discipline and journals by disorder, but nothing that brings together multiple disciplines and multiple disorders."

The primary focus of the journal is on the pathogenesis of neurodevelopmental disorders, including treatment studies relevant to understanding pathogenesis. Pathogenesis is the study of the origin and development of a disease or disorder. The journal will provide an interdisciplinary approach to pathogenesis of a wide range of neurodevelopmental disorders. Possible examples include cognitive/behavioral, brain systems, genetics and cellular/molecular neurobiological studies in conditions such as fragile X syndrome, Down syndrome, autism and fetal alcohol syndrome, Piven said.

The journal's inaugural issue is slated to appear in the first quarter of 2009.

"Overall, my hope is that the journal has a transformative effect on the field and is eventually viewed as a prestigious venue for presentation of important interdisciplinary work," Piven said.

Ting appointed founding director of immunology center

Jenny Pan-Yun Ting, PhD, Alumni Distinguished Professor of Microbiology and Immunology, has been appointed as the founding director of the Center for Translational Immunology. Her appointment was effective September 1, 2008.

Ting is also a member of the Lineberger Comprehensive Cancer Center (LCCC), for which she serves as leader of the immunology program. In addition to her appointment as an Alumni Distinguished Professor (1997), she has also been recognized by UNC with a Jefferson Pilot Award (1987) and a Hettleman Award for Scholastic Achievement (1993). Nationally, she served on NIH and Multiple Sclerosis study sections, has been awarded the American Society of Microbiology Award for Outstanding Contributions to the Field of Immunology and Immunity, and has been as associate editor and section editor of the *Journal of Immunology*.

The Center for Translational Immunology (CTI) will be composed of members from the basic sciences with the scientific training in molecular and biochemical immunology, genetics and/or an ability to translate findings in the bench to the bedside; clinical scientists with the potential to develop a strong clinical trials program, and with strong and solid understanding or training in basic immunology; an MD/PhDs or MDs with a strong record of basic science training and clinical experience. The CTI will be synergistic with the Departments of Microbiology-Immunology, Medicine, Radiology, and Surgery. Additionally, there will be strong collaborations with numerous centers and programs including the Infectious Disease Center, the Center for AIDS Research, the Gene Therapy Center, the Dental School, Lineberger Comprehensive Cancer Center, and the Carolina Vaccine Institute.

Ting will also serve as co-director of the Inflammatory Disease Institute (IDI) with Dr. David Peden, professor of pediatrics and director of the Center for Environmental Medicine, Asthma and Lung Biology (CEMALB). In her new positions, Ting will lead the expansion of UNC's scientific programs in all aspects of inflammation.

Eating disorders program director receives research award

Cynthia Bulik, PhD, director of the UNC Eating Disorders Program, has received the 2008 Price Family Award for Research Excellence from the National Eating Disorders Association.

Bulik

Bulik is the William R. and Jeanne H. Jordan Distinguished Professor of Eating Disorders in the Department of Psychiatry at the UNC School of Medicine.

The association cited Bulik for her outstanding contributions to the understanding of eating disorders.

Bulik's work focuses on the genetic and environmental factors that influence the risk of anorexia, bulimia nervosa and other eating disorders. She is the author of "Runaway Eating: The 8-Point Plan to Conquer Adult Food and Weight Obsessions," and the forthcoming book "Crave: Why You Binge Eat and How to Stop," due out this year.

Erickson awarded first Yoder Distinguished Professorship

Dr. Karen Erickson, director of the Center for Literacy and Disability Studies and professor in the Division of Speech and Hearing Sciences, has been selected as the first David E. and Dolores J. "Dee" Yoder Distinguished Professor in Literacy and Disability Studies at the UNC Department of Allied Health Sciences in the School of Medicine.

"The School of Medicine's strength in the field of communication disorders research is due in large part to the leadership provided by professors Yoder and Erickson," said Dr. William Roper, dean of the School of Medicine, vice chancellor for Medical Affairs and CEO, UNC Health Care System. "How fitting it is that we recognize David Yoder and his contributions to and leadership in the field by selecting Karen Erickson as the inaugural Yoder distinguished professor."

The Yoder Distinguished Professorship was established through the generosity of Maynard and Carolyn Sauder of

Archbold, Ohio, to stand as a perpetual tribute to the dedicated professionalism and skilled teaching and research of David E. Yoder, PhD, and the steadfast support of his wife, Dee.

Erickson holds a PhD in special education and literacy studies from UNC. Erickson is the 2004 recipient of the National Down Syndrome Congress Educator Award and the International Society for Augmentative and Alternative Communication Distinguished Literacy Leadership Award. Current research efforts involve school-aged students who struggle to read and write, school-aged students with complex communication needs, and children, adolescents, and young adults with multiple disabilities, including deaf-blindness.

Yoder is professor emeritus of speech and hearing sciences at UNC-Chapel Hill. He recently retired as executive director of the Council for Allied Health in North Carolina. Yoder was chair of the Department of Allied Health Sciences at UNC from 1986-2000. In 1988, he and Dr. David Koppenhaver co-founded the Center for Literacy and Disability Studies.

Dr. Wendy Brewster named director of Center for Women's Health Research

The Center for Women's Health Research has announced the appointment of Wendy R. Brewster, MD, PhD, as its new director. Brewster was chosen from an impressive field of candidates for the position after a year-long national search by a committee of multidisciplinary faculty under the guidance of Dr. Etta Pisano, vice dean for academic affairs in the UNC School of Medicine.

Brewster comes to UNC from the University of California-Irvine College of Medicine, where she was jointly appointed as an associate professor in the Department of Obstetrics & Gynecology and the Department of Epidemiology. After graduating from UCLA's David Geffen School of Medicine, Brewster completed a residency in obstetrics and gynecology at Harbor-UCLA Medical Center. A fellowship in gynecologic oncology at UC-Irvine followed, during which she also completed a doctorate in epidemiology.

She began her clinical and teaching responsibilities at UNC in November as an associate professor in obstetrics & gynecology in the Division of Gynecologic Oncology at the School of Medicine, with a joint appointment in epidemiology at the School of Public Health.

Brewster

Brewster has been characterized as a powerful ally for patients battling early stage invasive cancers. She is passionately committed to finding better methods of early detection and discovering underlying causes and will continue her research efforts at UNC.

"With her clinical experience as a gynecologic oncologist, doctorate in epidemiology, and expertise in health services research, she is the perfect fit for the Center," said Dr. John Thorp, Jr., the Center's deputy director. "We're fortunate to have such a renowned and dynamic individual take the helm as the Center prepares for new challenges ahead."

Department of Family Medicine launches radio talk show

The Department of Family Medicine in the UNC School of Medicine has partnered with 1360 WCHL radio to launch a new hour-long radio talk show on patient health.

The show, called "Here's to Your Health," provides practical health-related news and information to listeners primarily in Orange and Durham counties in North Carolina. However, it is also available to listeners anywhere in the world through podcasts on the WCHL (www.wchl1360.com) and UNC Health Care (www.unchealthcare.org) Web sites.

Goldstein

Page

Co-hosts of the show are Adam Goldstein, MD, MPH, and Cristy Page, MD, MPH, both School of Medicine faculty members who are actively involved in patient care at the UNC Family Medicine Center.

"Our department has a long history of community service, and we see 'Here's to Your Health' as a way for us to serve as a central resource of health information for thousands of people in Orange and Durham counties and across North Carolina," Goldstein said.

"We could not be happier with our partnership, and I am confident that Drs. Goldstein and Page will do a terrific job of informing the community about health related news and information," WCHL General Manager Walter Sturdivant said. "In almost every public affairs survey that I have ever seen there are always three things that lead the way and those are home, health and pocketbook. Our new health show rounds out our lifestyles programming in a way that helps us fulfill our commitment to our listeners."

The show is recorded rather than aired live, so it does not include a listener call-in segment. To allow listeners to participate on the show, the public is strongly encouraged to send their own health concerns, stories, suggestions and comments via e-mail to: yourhealth@unc.edu. Goldstein and Page read such stories on the air and arrange interviews with selected listeners.

"We're really hoping that people will participate in this," Page said. "We want to tailor our show based on the feedback we get from listeners."

Leone recognized for service to HIV/STD care in NC

Peter A. Leone, MD, associate professor at the University of North Carolina at Chapel Hill, has been awarded the 2008 Marty Prairie Award.

The award, presented by the North Carolina Department of Health and Human Services HIV/STD Prevention and Care Branch, is given to individuals or organizations whose work with HIV and other sexually transmitted diseases "exhibits distinguished, bold and innovative community service and or advocacy that positively impacts North Carolina."

Along with appointments in the UNC School of Medicine

and UNC Gillings School of Global Public Health, Leone is a member of the UNC Institute for Global Health and Infectious Diseases.

Leone has also served as medical director of the North Carolina HIV/STD Prevention and Care Branch since 2001, worked on various STD programs in nearly all of the state's 100 counties and represents North Carolina at the US Centers for Disease Control and Prevention and Department of Health and Human Services. Evelyn Foust, state AIDS director for North Carolina, said Leone was given the award for "his passionate work in helping to shape more responsive and current national policy regarding the HIV/STD screening and treatment programs, and for his steadfast commitment to directly helping people living with HIV/AIDS and other STDs."

A long-term survivor of HIV/AIDS who died in 2001, Marty Prairie was as an educator for the prevention of HIV/AIDS, STDs, TB and alcohol and substance abuse, especially among minorities, the homeless and gay men of color.

Weiner Receives H. Fleming Fuller Award

Timothy M. Weiner, MD, associate professor of surgery, Division of Pediatric Surgery, was awarded the prestigious H. Fleming Fuller Award at the November 13 meeting of the UNC Health Care Board.

"Dr. Weiner is a role model for other physicians to emulate," said Dr. Brian Goldstein, UNC Hospitals chief of staff.

"He is recognized by his colleagues as a physician who embodies an unwavering commitment to patient care delivered with honesty, compassion and state-of-the-art skill."

Given annually in memory of Fuller, a Kinston, NC, physician and founding member of the UNC Hospitals' board who died in 1986, the award recognizes doctors who demonstrate compassionate patient care and excellence in teaching and community service.

Weiner

Weiner developed the clinical anatomy course for first-year medical students, a course that has been voted "Course of the Year" for two consecutive years. He has also created a resident manual to assist the interns and residents in caring for pediatric surgery patients. For his teaching and mentoring efforts, Dr. Weiner has been recognized as Teacher of the Year in the Department of Surgery.

"Dr. Timothy Weiner believes in UNC Health Care's mission of providing the best medical care to all North Carolinians regardless of their ability to pay," Goldstein said.

Weiner's personal commitment to providing care to underserved populations has inspired him to become heavily involved in medical mission work. He has taken his love of helping those most in need and surgical skills to Africa, Vietnam and Cambodia.

"His mix of skill, scholarship, compassion and practicality has helped him connect with community pediatricians and has contributed substantially to their high level of confidence in seeking referral and consultation at UNC Hospitals," Goldstein said.

Weiner first came to UNC Hospitals in 1989 for his residency in general surgery after receiving his MD at Georgetown University. Following his residency, Weiner completed a fellowship in pediatric surgery at the Children's Hospital of Pittsburgh.

Teresa Tarrant receives James W. Woods Junior Faculty Award

Teresa Tarrant, MD, an assistant professor of rheumatology in the UNC School of Medicine, has received the school's James W. Woods Junior Faculty Award.

The award supports promising young members of the medical school's clinical faculty early in their academic career. Tarrant will receive $3,000 to explore new ideas and ways of teaching students and treating patients or to investigate biological problems.

Tarrant

Etta Pisano, MD, the school's vice dean for academic affairs, said Tarrant has demonstrated considerable skill in the clinical arena and embraced teaching enthusiastically.

Tarrant's research includes examining how leukocytes—also known as white blood cells, an important part of the immune system—migrate into tissues through the process of chemokine receptor signaling. Researchers believe the area is a promising therapeutic target for patients with organ-specific inflammatory diseases including asthma, multiple sclerosis and rheumatoid arthritis. She has also initiated collaborative research with the UNC Biomedical Research Imaging Center to test new nanomaterials for imaging of rheumatoid arthritis disease processes.

The Woods Award was established through the generosity of the late James Watson Woods, MD, a cardiologist and professor in the School of Medicine from 1953 to 1983.

McCudden receives NACB's George Grannis Award for Excellence in Research and Scientific Publication

Christopher McCudden, PhD, assistant professor of pathology and laboratory medicine in the UNC School of Medicine, is the 2009 recipient of the National Academy of Clinical Biochemistry's George Grannis Award for Excellence in Research and Scientific Publication. This highly competitive award is given to a trainee of the past three years, and consists of a plaque, a $2,500 honorarium, and a guest lectureship. At a stage where most have three or four manuscripts to their names, McCudden has 24 full papers, seven chapters, and 16 abstracts. He is first author for three of the six manuscripts published in *Clinical Chemistry*, the journal of the American Association for Clinical Chemistry (AACC). The awards ceremony will take place at the AACC annual meeting in Chicago in July.

Fund created to support Krabbe treatment, research

Paul and Susan Rosenau, of Waseca, Minn., have donated $250,000 to establish the Legacy of Angels Krabbe Fund in support of Krabbe disease treatment and research at the Carolina Institute for Developmental Disabilities at UNC.

The fund was created in appreciation of Dr. Maria Escolar's caring and compassionate work with children with Krabbe and other rare diseases. Dr. Escolar is a clinical associate professor of pediatrics at UNC and director of the Program for Neurodevelopmental Function in Rare Disorders (NFRD). The focus of her research is on the early diagnosis and treatment of children with rare lysosomal storage diseases such as Krabbe, Hurler syndrome, Hunter's syndrome, metachromatic leukodystrophy, and Tay-Sach's disease, to name a few.

"We have met many of the children Dr. Escolar has worked with and we are impressed with her commitment and passion for working in the field of rare diseases. Dr. Escolar truly cares about these kids and that is what it is all about. If we can help to save one child, it is well worth every cent," said Paul Rosenau.

The Rosenaus lost their first granddaughter, two-year-old Makayla Pike, to Krabbe disease almost six years ago. Last May, on the fifth anniversary of her death, the Rosenaus learned that they had won the largest Minnesota Powerball Lottery in the state's history. The Rosenaus elected to take the lump sum payment, which, after taxes, amounted to approximately $60 million.

Since that time, the couple has already donated $10 million to various medical, charitable, educational, and religious organizations, and has begun the process of forming a private charitable foundation, called The Legacy of Angels, with the remainder.

"When we won that jackpot, we were given a responsibility. We wanted to use our Minnesota winnings to serve the Waseca community. But our gift to Dr. Escolar's work in expanding newborn screening and finding a cure for Krabbe and cystic fibrosis helps the world community," Sue Rosenau said. "We find great joy in that."

11th Annual UNC Dance Marathon Raises Almost $400,000 for North Carolina Children's Hospital

After a full year of fundraising and 24 straight hours standing up, "For the Kids," the 2009 UNC Dance Marathon announced in February that it raised $394,278.94 during the past year to benefit the children and families of North Carolina Children's Hospital. This total represents more than a $70,000 increase from the previous year and brings the organization's 11-year fundraising total to more than $2 million.

The year's fundraising total was revealed at the conclusion of this year's 24-hour Marathon—which featured a record number of UNC-Chapel Hill student-dancers and a full schedule of performance groups, guest speakers and visits from children and families from the Children's Hospital. Some of the event's highlights included UNC Football Coach Butch Davis' kickoff speech, a barbeque lunch at the Bell Tower on UNC's campus, and a visit at UNC Hospitals from Keeley Simmen, who was diagnosed with cerebral palsy at UNC Hospitals when she was three years old.

UNC students played an enormous role in raising money for the Hospital. Besides pledging to stand on their feet for 24 consecutive hours at the Marathon, the more than 1,800 students who signed up to dance also agreed to raise at least $100 for the cause. In addition, more than 200 committee members serving on 13 different committees organized events throughout the year that contributed to the fundraising total including a golf tournament, benefit concerts, and coin-collecting drives at UNC football games.

Funds raised by the UNC Dance Marathon are allocated in a number of different ways to support the patients and families of NC Children's Hospital. Each year, the organization gives a portion of its fundraising dollars to the For the Kids Fund, which provides for expenses not covered by insurance or Medicaid that families may not otherwise be able to afford. In addition, the Marathon offers several divisional grants each year to departments within the Children's Hospital.

NCSU's 5th Annual Krispy Kreme Challenge raises money for North Carolina Children's Hospital

Runners and supporters from all across North Carolina participated in the Fifth Annual Krispy Kreme Challenge on Saturday, February 7, to raise money for North Carolina Children's Hospital in Chapel Hill.

An estimated 5,519 Challenge participants ran two miles from the NC State Belltower to the Krispy Kreme Doughnuts store on Peace Street, ate a dozen doughnuts, and then ran the two miles back to the Belltower. Successfully completing the Challenge requires participants to finish the entire race in less than 60 minutes.

Early estimates on the funds raised this year top $35,000. "I can't think of another instance when eating doughnuts actually improves health," joked Dr. Alan Stiles, physician-in-chief of North Carolina Children's Hospital. "All kidding aside, North Carolina Children's Hospital is proud to be the beneficiary of the Krispy Kreme Challenge. The money raised will have lasting impacts on our pediatric patients all year long."

For more information about the Krispy Kreme Challenge visit www.krispykremechallenge.com. The Krispy Kreme Challenge is not operated by Krispy Kreme Doughnut Corporation or its affiliates.

60s

W. Stacy Miller, MD '61, retired in 2004 after 37 years of private practice dermatology in Raleigh. He is now enjoying his retirement by playing golf; spending time in the mountains near Boone, NC; traveling; watching his grandchildren play sports; and following UNC sports. He lives in Raleigh.

Dave M. Davis, MD '63, spoke at the United Nations in New York, NY, on December 11, 2008, at the UN's 60th anniversary. Davis's speech was titled "Human Rights Abuses Toward the Mentally Ill in Developing Countries." He lives in Atlanta.

70s

Karen Rhea, MD '73, has been appointed to the newly created post of chief medical officer at Centerstone, the nation's largest provider of community-based behavioral healthcare, in Nashville, Tenn. Rhea previously served as vice president for medical services at Centerstone. In her new role, Rhea will oversee Centerstone's medical services staff and ensure that its psychiatric services are effectively integrated within all of the organization's programs throughout Middle Tennessee. She is currently an assistant clinical professor of psychiatry at the Vanderbilt School of Medicine. Rhea received her MD with honors from the UNC School of Medicine.

80s

Al Osbahr, MD '85, is the medical director of occupational health at the Catawba Valley Medical Center. He was recently inaugurated as the 155th president of the North Carolina Medical Society. He lives in Hickory, NC.

90s

Steve Hindes, MD '92, MPH, reports that he works four days a week as a family physician in his private practice and spends one day a week teaching Greek and Roman history in the graduate school at the University of Denver. He published a book, *Think For Yourself*, in 2005. He has two children, Nicolaus (born in 2002), and Alex (born in 2004). Hindes lives in Evergreen, Colorado.

00s

Peter Ward, PhD '02 is a principal scientist at Johnson & Johnson PRD. He married Christina Spence Ward in 2004. They have one child, Caroline Anneliese, who was born on April 9, 2007. They live in San Diego.

Ian Buchanan, MD '04, MPH, has been appointed as associate vice president for the oncology service line at UNC Health Care. Ian graduated from UNC School of Medicine and completed his residency and post-doctoral fellowship in the Department of Surgery. He also earned a master's from the School of Public Health. Ian joined UNC Health Care on December 1, 2008. Prior to coming to UNC, Buchanan was an executive with United Health Care and worked with their global clients in chronic disease management and behavioral health.

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In Memoriam

Alexander Fairley Goley, MD '56, died at the Hospice Home in Burlington, NC, on Sunday, August 24, 2008. He was 78.

He was born July 7, 1930 in Graham, NC the son of Dr Willard Coe Goley and Eugenia Fairley Goley. He was a graduate of Davidson College and the UNC School of Medicine Goley was an intern, resident and a fellow at Yale Medical School As a captain in the US Army, he was stationed at Walter Reid Army Institute of Research for two years

Goley practiced internal medicine in Burlington from 1962 to 1995. He was certified by the American Board of Internal Medicine in 1963 and 1974 He was elected to fellowships in the American College of Physicians in 1990.

Goley was inducted into the honorary medical fraternity Alpha Omega Alpha and served as chief of staff of Alamance County Hospital He was an active and loyal member of Front Street United Methodist Church where he served as chairman of the Board of Trustees, chairman of the finance committee and president of Methodist Men. He was an assistant clinical professor of medicine at UNC School of Medicine, a member of the Admissions Committee for the UNC School of Medicine, and served on the Parents Council of Wake Forest University He was president of the Sigma Alpha Epsilon Fraternity at Davidson College, a director of the Alamance Historical Museum, and served on the Executive Board and also the Eagle Board of the Old North State Council of the Boy Scouts of America. He was an Eagle Scout and always supportive of scouting

Dr Goley was preceded in death by his wife of 39 years, Sallie Cook Boren of Greensboro, NC He is survived by his three children, William Rankin Goley and his wife, Kelly of Charlotte, NC, Daniel Boren Goley and his wife Helen of Greensboro, NC, and Clare Goley Palumbo and her husband, John, of Charlotte, NC, six grandchildren, Alex Patrick Gray Rachel Clay and Sallie Anna, a brother Willard Coe Goley Jr and his wife Mary Ann of McCormick SC a sister Eugenia Goley Pruitt and her husband Ronald of Burlington NC

James F. Richards Jr., MD '56, died September 7, 2008. The Orlando, Fla., resident was 77. Richards was born in Fort Wayne, Ind., and married Joann Ellen Felske in 1953. He earned his undergraduate and medical degrees from University of North Carolina at Chapel Hill in 1956, and served nine years as a lieutenant commander with the US Naval Reserve

In 1962, after finishing his residency in New Orleans Richards moved to Orlando and began his orthopedic practice He formed a partnership with other physicians and established Mathews, Flynn & Richards in 1966.

An orthopedic surgeon for more than 30 years, Richards served on many professional boards including the Florida Medical Association, Orange County Medical Society, Florida Orthopedic Society and American Academy of Orthopedic Surgeons.

Richards never lost his sense of wonder about natural history. Richards shared his knowledge about fossils, wildlife and the mechanics of the human body with anyone who would listen. When he wasn't exploring the world of science, Richards enjoyed spending time with his wife of 55 years, Joann Richards, and his dog, Louie.

Richards is survived by his wife, Joann, of Orlando; a daughter, Meg Perella, of Kensington, Md.; a son, Daniel Richards, of Orlando; and four grandchildren.

James B. "Jimmy" Glover, MD '57, died at Presbyterian Hospital in Charlotte on December 20, 2008. He was 77

Born in Wadesboro, NC, on October 30, 1931, he was the son of the late James Allen and Mable Dabbs Glover Jimmy was raised in Nashville, NC. He completed his undergraduate degree at the University of North Carolina and, in 1957 received his MD from UNC's School of Medicine He served three years in the Navy as a medical officer interned at the University of Alabama, and completed his residency in obstetrics and gynecology at NC Memorial Hospital He practiced for 30 years in Wilson, NC providing compassionate care for his patients

He was always delighted to be greeted by former patients and often to be introduced to their children—babies he had delivered now grown to adulthood. He enjoyed all children, especially his own five grandchildren, who, like his two sons, called him "Doc Doc was a devoted father, grandfather and husband.

He is survived by his wife of 52 years Harriet; his sons Jimmy and John and their wives, Tina and Sallie respectively, all of Raleigh and his five grandchildren, Sallie, Jack, Anderson, Lucy and Ella, his sisters, Pat Glover of Greensboro, and Linda Hunter and her husband, Tom, of Charlotte, a nephew and a niece.

Doc was an avid UNC basketball fan, rarely missing a home game for more than 40 years Golf was another favorite sport His wonderful dry wit could end any tense situation, leaving everybody laughing He was happiest at his home on the Bogue Sound, spending 30 wonderful summers there with his family He recognized how blessed he had been in his 77 years We will all miss his steady wisdom and the kindness of a caring physician, friend, father and grandfather

Donald R. Schulte, MD '62, died at home in Southern Pines, on November 25 2008, surrounded by his beloved family He was 78.

Schulte attended the UNC School of Medicine and was licensed to practice medicine in North Carolina on June 15 1962. In 1965, Schulte moved to Southern Pines, where he directed the Sandhills Mental Health Center until 1975 when he opened his private psychiatric practice on Midland Road

He is survived by his wife Mary Lee Schulte and children, Raymond Schulte, Lori Sparrow (Robert) Becky Schulte Anderson (Larry) and Stuart Schulte (Hong) His extended family includes two grandchildren Alex and Lindsey Sparrow of Hillsborough as well his younger brother, Edward Schulte (Elizabeth) and sister, Joan Price (Thomas) all from Kentucky as well as a large number of nieces and nephews

The Joy of Cooking

Continued from page 17

clean up.

"There are really two polar opposites among the people who eat there," Goy said. "Some people take the trouble to say 'Thank you for feeding us a great meal.' Other people will say, 'I don't like that and I don't want to eat it.'"

While such comments test his sense of humility, Goy said, he has learned to hold back.

"The people who walk in there to eat are about as far down in the power structure of this country as you can get," he said. "If they don't have the right to say they don't like what they are eating, they would have no power at all. That's why I let such comments slide. They should have power over something as personal as what they put in their mouths."

While he forgets about the complaints, he makes it a point to savor the compliments.

"Somebody once told me that my cornbread was better than their mama's," Goy said. "I loved that. I consider that to be the highest praise I've gotten."

This article originally appeared in the October 29, 2008, issue of UNC's University Gazette. *Reprinted with permission.*

UNC study hints at new approaches

Continued from page 5

They found that the skin damage appeared to stem from the production of IL17 and its sister cytokines, while destruction in other tissues came from a protein called TNF-alpha. Interestingly, these findings lend support to the strategy employed by some clinicians to treat the manifestations of the disease with drugs that block TNF-alpha.

"For our findings to ever make an impact clinically, we would have to confirm that there are two main branches leading to the disease," said Serody. "Then we would need to take an approach that neutralizes both—simultaneously blocking the original suspect, interferon gamma, and our newest culprit, cytokines made by TH17 cells, to treat GVHD."

Research on that TH17 branch has already sparked the interest of some pharmaceutical companies such as Wyeth, and Serody predicts that there will be a number of drugs coming out in the next five years to treat immune-based skin diseases.

The research was supported by the National Institutes of Health. Study co-authors include research analyst Michelle L. West and clinical fellow James M. Coghill, MD, from the UNC Lineberger Center; and Angela Panoskaltsis-Mortari, PhD, and Bruce Blazar, MD, at the University of Minnesota Cancer Center.

Health Care Reform

Continued from page 37

be aided by both the Obama campaign's grassroots network and organizations devoted to reform, whose resources can help mobilize public support.

Of course, these grounds for optimism hardly guarantee success. Financing health care reform in this fiscal climate will be an extraordinary political challenge, deep divisions persist in Congress, and many thorny problems are nowhere near resolution. Throughout the past century, reformers pursuing comprehensive change in the US health care system have failed to overcome similar barriers. But the fact that reform has failed before does not mean it is fated to fail forever. As the election of Barack Obama vividly reminds us, history is not always repeated. Sometimes it is made.

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Pillars of Strength

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'core measures' for hospital care," says Goldstein.

Similarly, internal transparency is key to raising the quality of care, and it takes a commitment from all employees. "We worked hard to create an improved reporting culture—what we call a 'just culture,'" says Goldstein. "The idea being that we want our employees to feel empowered to report concerns about the quality of care delivered, the quality of service delivered [or] a potential hazard they might identify. We want them to feel supported in sharing that information. And we want them receive feedback once they do report something."

This "just culture" serves in particular to create an environment conducive to increased patient safety. Like quality initiatives, those focusing on the safety of the patient have become a standard at UNC Hospitals. Patient Safety Leadership Rounds occur routinely throughout the hospitals, for example. Patient Safety Huddles occur in each nursing unit during shift changes. And the Agency for Healthcare Research and Quality's Hospital Survey on Patient Safety Culture was administered system-wide in 2006 and again in 2008, with results analyzed and reported back to all staff.

Continuous improvement

As is the case in any large, complicated organization, improvement at UNC Health Care must be continuous, and always a priority. While the contract with Baptist is at its end, the work of the past few years—most notably through the Commitment to Caring initiative—has laid the groundwork for continued strides, especially in the areas of quality of care, patient safety and patient satisfaction. "We must never stop paying attention," says O'Neal. "We have always taken the patient experience very seriously. We have to partner with our patients. Above and beyond satisfying the patient, it's about doing what's right."

CORRECTIONS

The contributions of Dr. Mauricio Cohen were regretfully omitted from the story titled "Paso A Paso," which appeared in the Fall 2008 issue of the *Bulletin* (pg. 12). A former director of the UNC Latino Health Initiative, Dr. Cohen's research and expertise were instrumental in the creation of the UNC Center for Latino Health (CELAH), the School of Medicine's Comprehensive Advanced Medical Program of Spanish (CAMPOS), and the Health Bridges Project (Proyecto Puentes De Salud) in Juventino Rosas, Mexico.

Great Expectations:

The **Obama** Administration and **Health Care Reform**

By Jonathan Oberlander, PhD

Dr. Oberlander is an associate professor of social medicine and of health policy and management at UNC, and a visiting scholar at the Russell Sage Foundation, New York.

Health care reform is back. For the first time since 1993, momentum is building for policies that would move the United States toward universal health insurance. President Barack Obama has made health care a central part of his domestic agenda, and key members of Congress have promised to introduce ambitious health care reform legislation in 2009. Groups long opposed to reform, including the insurance industry, are reportedly prepared to make a deal. There is thus growing sentiment that "the prospects for meaningful health care reform have never looked better."[1]

Even so, the political barriers to reform remain immense. The Obama administration has an agenda crowded with other priorities—the economy, taxes, Iraq, Afghanistan, energy policy—and a failure on health care reform could sap its political capital. Although Democrats enlarged their congressional majorities in the 2008 elections, President Obama will not enjoy anything like the supermajorities that Presidents Franklin D. Roosevelt and Lyndon Johnson counted on to enact Social Security and Medicare. This means that to pass its health care plan the Obama administration will have to rely on conservative and moderate Democrats in Congress, many of whom have their own agendas for reform. In the Senate, moderate Republicans would have to help secure the 60 votes necessary to defeat a potential filibuster. Indeed, the Democratic majorities in the House and Senate are very close to those that were in place when the Clinton administration unsuccessfully pursued health care reform during 1993 and 1994.

Moreover, although there is widespread consensus that the US health care system is broken, there is no consensus on how to fix it. In Congress, even advocates of universal coverage are divided over whether to build on or away from employer-sponsored insurance, the latter approach being favored by a group led by Senators Ron Wyden (D-OR) and Robert Bennett (R-UT).[2]

Stakeholders in the health care system and conservative lawmakers will surely resist core elements of Obama's reform plans, including the establishment of a new government insurance program (anathema to the insurance industry). It's easy to forget that in 1993, key groups of stakeholders endorsed health care reform before their support evaporated.[3] It remains unclear whether similar rhetorical support from such stakeholders this time around will translate into sustained backing for comprehensive legislation as the debate inevitably turns to details that will affect their livelihood and organizational autonomy.

Perhaps because they proved to be politically lethal for the Clinton administration, serious proposals for controlling health care spending are scarce. The health care industry is not interested in reform that would reduce its income. Policymakers are therefore emphasizing savings that might be gained from disease prevention, the implementation of electronic medical records, and other unproven (but politically safe) cost-control measures.

There is also a dearth of politically feasible ways to pay for a major expansion of insurance coverage, which could easily carry a price tag exceeding $100 billion per year—a financing challenge exacerbated by the ballooning federal budget deficit. Health care must compete for money with other costly initiatives, including economic-stimulus and tax-cut plans. Meanwhile, the faltering economy means that more Americans will become eligible for Medicaid, so substantial federal funds will be required just to maintain existing programs.

There is thus ample reason to believe that promoters

of comprehensive health care reform will fall short of their goal during the Obama administration. Instead, Congress may well enact a series of incremental laws, taking steps such as expanding the State Children's Health Insurance Program (SCHIP), investing in health information technology, and changing Medicare's physician-payment formula.

Although reform remains improbable, that does not mean it is impossible. Indeed, there are also reasons to believe that comprehensive reform could be achieved under the Obama administration. The ongoing economic crisis will give the administration an extraordinary political opportunity. Worsening unemployment has a direct and dramatic effect on health insurance coverage: with every percentage-point increase in the unemployment rate, 1 million Americans could become uninsured (an additional million could gain coverage under Medicaid and SCHIP).[4] If the recession deepens, the country's uninsured population could grow dramatically, drawing media attention and pushing health care up near the top of the public agenda. The anxiety that middle-class Americans feel about losing their coverage and paying their medical bills will also intensify, creating pressure for federal action.

In addition, the federal government's interventions to prevent a collapse of the country's banking and financial systems have created a precedent for expanding government to cope with the economic emergency. The Obama administration and congressional reformers could frame the expansion of insurance coverage as part of a broader economic recovery plan, with health care reform sold as integral to restoring Americans' economic security.

Health care reform could also be sold as critical to reviving businesses'—and therefore the nation's—economic fortunes. If US businesses concluded that government intervention is necessary to save them from the burden of health care costs during the economic downturn, the politics of health care would be transformed. With big business on their side, reformers would have an influential ally to help offset potential opposition from the health care industry. Small businesses, which are less likely than larger corporations to provide insurance for their workers, are a tougher political target. But if the status quo is bad enough, political organizations representing small firms (and perhaps other stakeholders) may conclude that reform is preferable to more of the same.

Paradoxically, the economic crisis could also make the financing of health care reform more politically palatable. With the 2009 federal deficit potentially topping $1 trillion, an expansion of insurance coverage could suddenly appear comparatively affordable. Similarly, the vast sums spent on corporate bailouts could help legitimize the idea of deficit spending for health care reform. The economic crisis could thus give reformers the political leeway to bypass congressional budgeting rules that otherwise constrain financing options.

In sum, the recession could weaken the normal barriers to health care reform (at a minimum, it injects substantial uncertainty into health care politics). Yet there are other reasons to be hopeful about reform. One is that the incoming administration appears to have learned from the Clinton administration's misadventures in health care reform. President Obama's nomination of former Senate majority leader Tom Daschle as secretary of Health and Human Services and director of the new White House Office of Health Reform reinforces the administration's intention to work closely with Congress in crafting reform legislation rather than imposing a top-down plan. Obama's health plan (as outlined during the campaign) clearly embodies additional lessons from the Clinton reform debacle: it preserves employer-sponsored insurance for insured Americans who don't want to change plans, it exempts small businesses from the employer mandate to provide health insurance while providing tax credits for small companies that want to purchase insurance, and it contains no politically controversial, centralized cost controls.

> Health care reform could also be sold as critical to reviving businesses'—and therefore the nation's—economic fortunes.

The lessons of 1993 and 1994 are also well understood in Congress. Two key senators—Max Baucus (D-MT), chair of the Finance Committee, and Edward Kennedy (D-MA), chair of the Health, Education, Labor and Pensions Committee—are developing legislation that largely tracks the Obama plan. Consequently, this time around, congressional Democrats may be more unified around a health care reform strategy. Baucus's support for reform is crucial, given the importance of financing issues, and Kennedy's staff has been holding meetings with stakeholders in an effort to build consensus. Both senators are determined to move quickly, fearful that delay could forfeit momentum as it did in 1994.

Finally, if Barack Obama's health care reform team has a president who could effectively use the bully pulpit to rally the public behind change. That effort [illegible]

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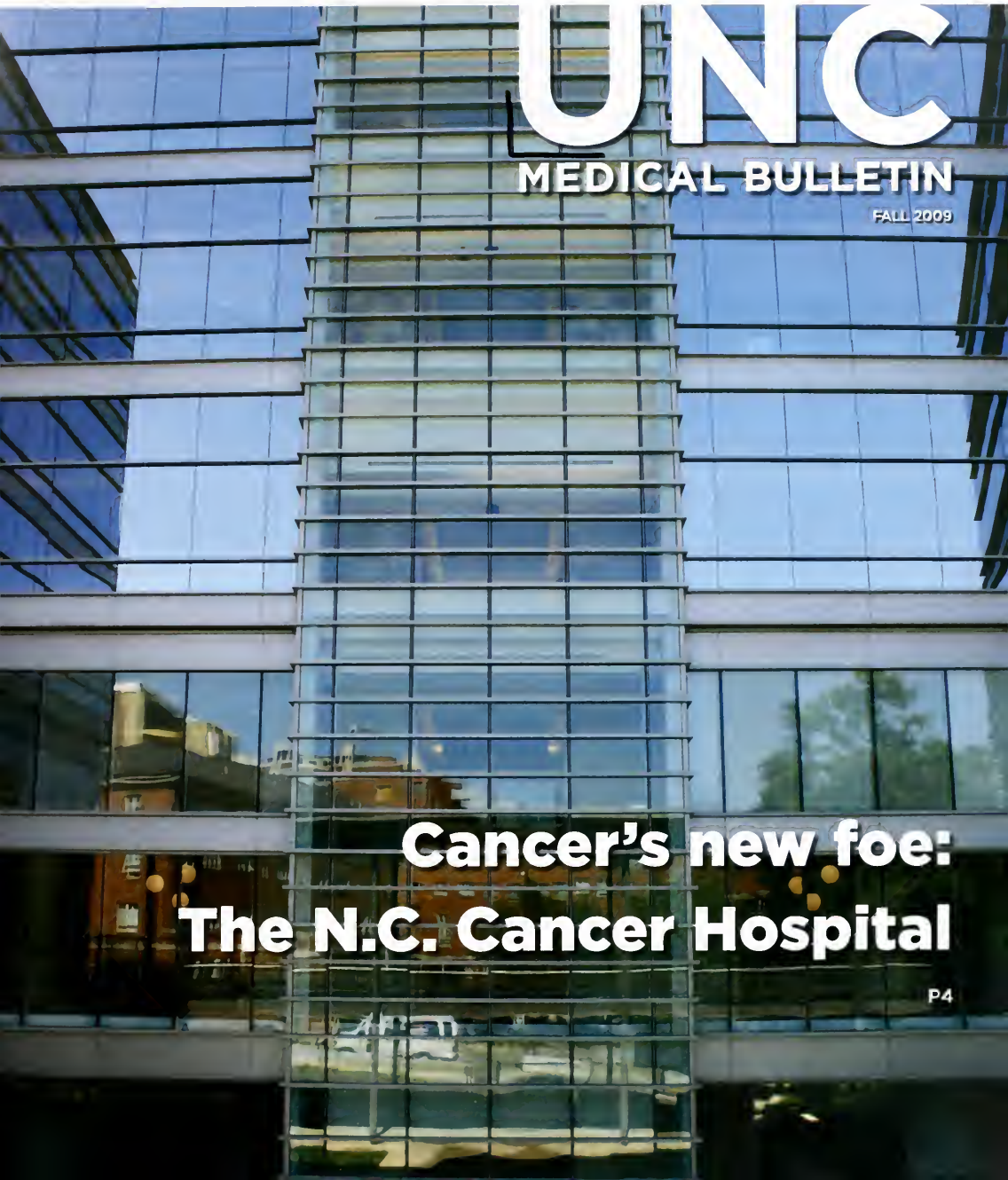

UNC MEDICAL BULLETIN

FALL 2009

Cancer's new foe: The N.C. Cancer Hospital

P4

Creating a CAROLINA LEGACY

Photo by Lee Sakow

DENMAN AND POLLY HAMMOND

✦ *A Full Circle* ✦

HAMMONDS CONTINUE CAREER-LONG CAUSE WITH PLANNED GIFT TO UNC LINEBERGER COMPREHENSIVE CANCER CENTER

WHEN DENMAN HAMMOND '44, '46 (CMED) and his wife Polly wanted to make a planned gift to help combat childhood cancer, they chose the place where his career began: UNC-Chapel Hill. Their $1.3 million gift to the Medical Foundation will allow UNC Lineberger Comprehensive Cancer Center and its pediatric oncology program to make large strides in research to better understand and treat cancers that affect the smallest and most vulnerable of our population.

"POLLY AND I HOPE that the proceeds from our charitable remainder trust will assist in supporting outstanding specialists to advance research, care and teaching to benefit children and adolescents with cancer," Hammond said. The Hammonds transferred stock to the trust and designated UNC Lineberger as the charitable beneficiary. The trust pays the Hammonds income during their lifetimes and at their deaths will provide financial support for UNC Lineberger. "We have been very pleased with our decision."

HAMMOND'S CAREER in medicine was recognized by UNC in 1994 when he received the UNC School of Medicine Distinguished Service Award for his professional service and leadership accomplishments. Hammond was the founding director of the University of Southern California Comprehensive Cancer Center, the founder, past president and CEO of the National Childhood Cancer Foundation; a member and principal investigator of the national Children's Cancer Group (CCG) for 11 years at Childrens Hospital Los Angeles, and thereafter served for 24 years as group chair. He authored or co-authored more than 300 scientific manuscripts and book chapters, and served as a national director and officer of the American Cancer Society.

"DENNY AND POLLY are committed to our vision to have UNC Lineberger become a national leader in curing childhood cancer," said H. Shelton Earp III, the center's director. "Denny knows first-hand that great strides have been made, but research on childhood cancer remains a critical need."

If you're interested in creating your Carolina legacy, please contact Jane McNeer, vice president of The Medical Foundation of North Carolina, Inc., at 919-966-3946 or 800-962-2543 or Jane_McNeer@med.unc.edu. You may also contact Candace Clark, associate director of planned giving, at 919-962-3967 or 800-994-8803 or createalegacy@unc.edu.

The *Berryhill Society*

THE UNIVERSITY of NORTH CAROLINA at CHAPEL HILL

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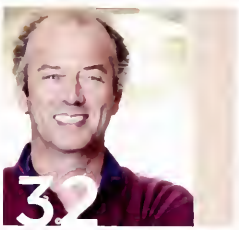

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The *UNC Medical Bulletin* is published for the alumni and friends of the University of North Carolina School of Medicine and UNC Health Care.

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ON THE COVER

The old Gravely building is reflected in the windows of the new state-of-the-art N.C. Cancer Hospital. The more than 320,000 square-foot hospital will substantially improve patient care and stimulate cancer research. Photo by Rachel Gerber, Tarheel Digital Photography

N.C. **Cancer** Hospital **showcases** top-notch **programs**

By Richard M. Goldberg, MD
Richard M. Goldberg Distinguished Professor of Gastrointestinal Cancer Research
Physician-in-Chief, N.C. Cancer Hospital
Associate Director of Clinical Research,
UNC Lineberger Comprehensive Cancer Center

Medical School alumni, former house staff and fellows returning to UNC-Chapel Hill are amazed at the tremendous growth of UNC Health Care's campus. It is always fun to hear their memories about what it was like to train at NC Memorial Hospital or in facilities that no longer exist.

Another one of these landmarks, the Gravely building, is slated to come down to make room for safe traffic management and patient dropoff at UNC Hospitals. The building has been a fixture on campus since the 1950s and was most recently pressed into service to house our fast-growing outpatient oncology practice. Originally built as a tuberculosis sanatorium, its rather humble appearance belies the excellence that UNC has built in cancer research and treatment over the last quarter century.

It's here that we developed our nationally-recognized model for multidisciplinary patient and family-centered care. At many institutions, cancer patients have to navigate the system, meet separately with many different specialists, and then process and evaluate multiple—and sometimes conflicting—recommendations. At UNC, a patient's program coordinator schedules appointments with a number of specialists during one visit. The results of these appointments are then carefully reviewed at a team conference, often on the very same day.

Multidisciplinary conferences have proven critical to improved patient care, streamlining treatment pathways and improving access to clinical trials of new therapies. For patients and families, this means that they are located at the hub of a system where a team of caregivers, including surgical oncologists, medical oncologists, radiation oncologists, nutritionists, behavioral health specialists, symptom management specialists, and others review each patient's case together and recommend a combination of therapies tailored to the patient's individual needs.

Today, more than 15,000 individuals with cancer

make more than 110,000 visits to UNC per year. While we have been providing some of the best care in the nation under the direction of a world-class faculty and staff, patients and their families have been forced to see us in a crowded and outmoded facility. Not only have we outgrown the physical spaces in the Gravely building, but its 50-year-old design doesn't easily accommodate the newest technology without significant effort on the part of our dedicated providers.

That's why we are truly excited as we anticipate the opening of the N.C. Cancer Hospital—a facility that reflects the excellence of the care we provide. Physicians, nurses, patients and others have been involved in adapting the new spaces to the multidisciplinary system of care we have developed at UNC.

The practice of medicine is increasingly driven by technology, but this leading-edge facility will combine the best technology with an environment that emphasizes a healing atmosphere and the human touch through natural light, nature-inspired interior finishes, public art, indoor courtyards, gardens, and other amenities.

The state authorized $180 million for the project. In August 2004 and UNC Health Care contributed an additional $30 million that was required when the costs of building materials skyrocketed nationwide in the wake of Hurricane Katrina. Thanks to this investment, the 320,000 square-foot hospital is three times the size of the Gravely building and will significantly increase the number of patients that can be served, with 101 state-of-the-art examination, treatment, consultation, and procedure rooms.

We're pleased that we'll be able to provide a great patient experience in a fantastic facility, but this experience is a product of the dedicated people and outstanding programs at UNC Lineberger Comprehensive Cancer Center and UNC Health Care.

UNC Lineberger researchers are collaborating across disciplines to understand the basic mechanisms behind cancer, open up new fields of inquiry, and create treatments that focus on cancer's biological vulnerabilities. With more than $147 million in grants from the National Institutes of Health each year, our internationally-recognized researchers successfully compete and collaborate with peers at the most elite institutions around the world.

The creative collaborations at UNC have led to innovative programs in nanotechnology, genetic medicine, drug development, imaging techniques and radiation therapy. We're learning about how the environment interacts with genetics to cause cancer and how we can stop it. We're understanding how to personalize treatments for each patient, saving valuable time and sparing them from undergoing therapies that we know won't work with their personal disease and genetic profile. Patients at the N.C. Cancer Hospital will reap the benefit of this work, gaining access to clinical trials of new treatments before they are widely available.

Our researchers are learning about the best ways to deliver care and improve health behaviors that impact cancer risk. Faculty and staff are working across the state, carrying out health assessments and pilot programs to understand and address health disparities. Innovative programs are addressing the unique challenges faced by cancer survivors and taking proven techniques into North Carolina communities to enhance prevention and screening.

This is all part of our commitment to taking UNC's research from the laboratory to the patient and from the academic sphere to communities across the state and beyond. As we take new treatments and best practices in patient and family support and health improvement from the university to our patients, the N.C. Cancer Hospital will provide a clinical home for these activities—a space to expand and build on the excellence we have established in cancer prevention, research and treatment.

You'll read more about the hospital's features in this issue of the *UNC Medical Bulletin*. We are proud of, and hope that you too will take pride in, this visible symbol of what we are achieving through collaboration, creativity and innovation. It will truly make a difference to all those whom we serve here in North Carolina and, we hope, to patients and families around the world whom we may never meet, but whose lives are improved in some way because of the work we do.

Please join us Sept. 15th!

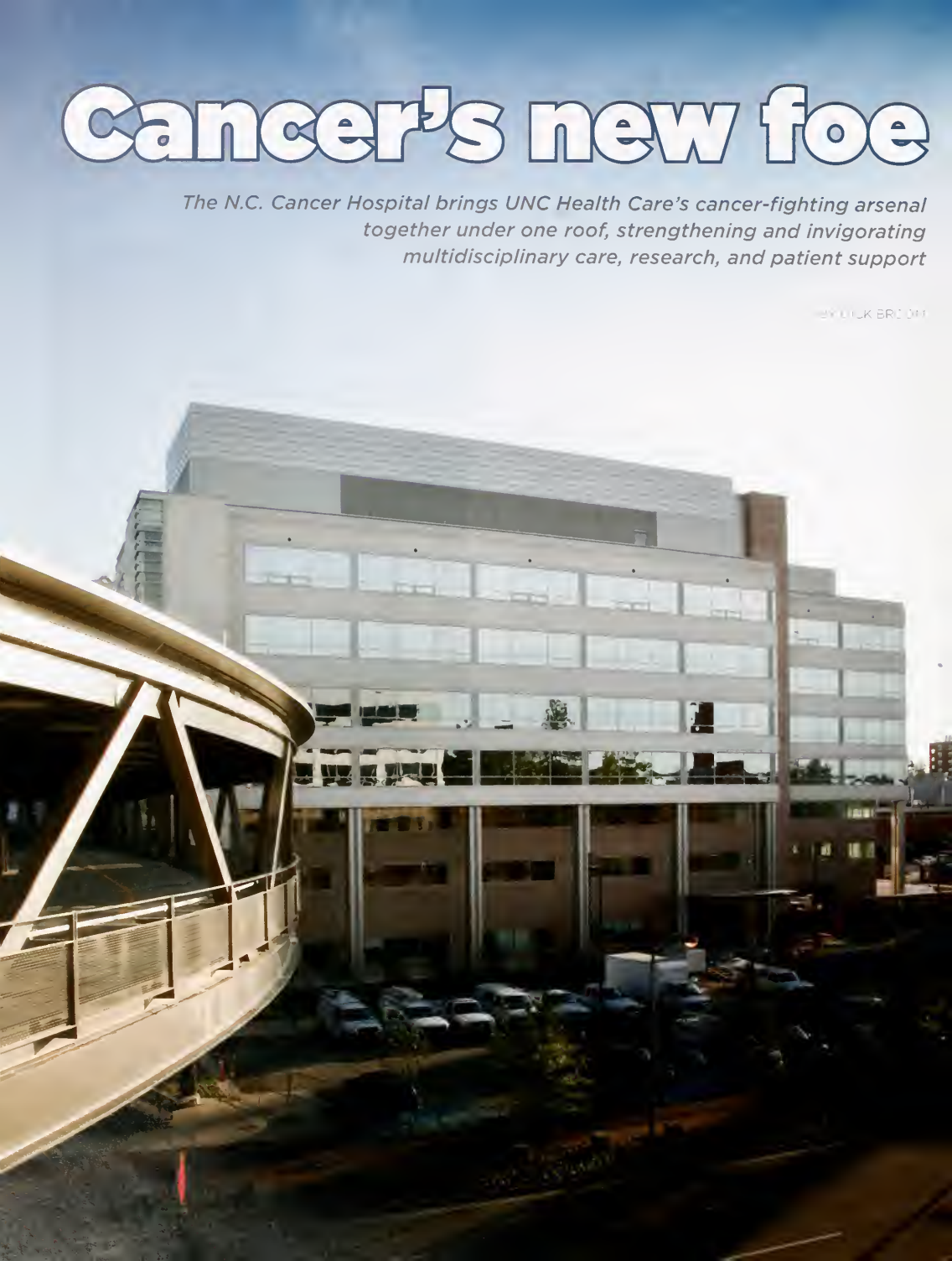
Please join us September 15, 1-3 p.m., in the courtyard of the N.C. Cancer Hospital, as we open the doors of the hospital to the people of North Carolina and celebrate the new face of cancer care with a dedication ceremony, tours of the hospital's public spaces, light refreshments and a viewing of the specially commissioned photography exhibit, "The New Face of Cancer Care." This exhibit celebrates the strength and courage of the patients, medical professionals, researchers, caregivers, family and friends who face cancer every day, and whose images and stories serve as an inspiration to all. You are invited to participate in the exhibit as well—visit www.unclineberger.org and click on the "New Face" icon.

Additionally, an open house will be held Saturday, September 26, 2009 from 1-3 p.m. To learn more about the N.C. Cancer Hospital, visit www.unclineberger.org.

Cancer's new foe

The N.C. Cancer Hospital brings UNC Health Care's cancer-fighting arsenal together under one roof, strengthening and invigorating multidisciplinary care, research, and patient support

BY DICK BROOM



Is it a medical miracle for UNC to have so many top-notch cancer specialists and a national reputation for excellent care, despite the cramped and inefficient building that has housed cancer patient care services for more than two decades? Many would say so.

But now, with this fall's opening of the N.C. Cancer Hospital, the physical home of cancer care at UNC is world-class, matching the excellence of the physicians and staff and the clinical services they provide.

"Patients have been coming to UNC and putting up with the facilities because our faculty physicians and staff are so good," said Richard Goldberg, MD, chief of the Division of Hematology and Oncology in the Department of Medicine, associate clinical director of UNC Lineberger Comprehensive Cancer Center and physician-in-chief of the N.C. Cancer Hospital. "The new hospital—spacious, well designed and aesthetically pleasant—is a perfect complement to the people who will be taking care of patients there."

With 320,000 square feet of space, the new hospital is more than three times the size of the Gravely building, which was built in 1952 as a tuberculosis sanatorium and, since the 1980s, has housed many of UNC's clinical cancer services.

The hospital is shaped like the letter "C," which some might think stands for "cancer" or, perhaps, "Carolina." Goldberg likes to think it stands for "cure." That is certainly the goal of the programs that, in the new building, will be expanding to serve many more North Carolinians with cancer.

Unfortunately, the need for cancer care is greater than ever and continues to grow. Cancer affects half of all men and one-third of all women at some time in their lives. Last year, cancer overtook heart disease as the number one cause of death in North Carolina. The number of cancer patients seen by UNC physicians has been increasing by about 9 percent each year and last year exceeded 15,000. Goldberg said he expects the annual increase to approach 15 percent as the population ages and more people choose to come to the N.C. Cancer Hospital for their care.

The new hospital is opening in stages that began this summer and continue into this fall. It has 50 inpatient beds for medical oncology and bone marrow transplant patients, and 72 chemotherapy infusion stations. The hospital also houses adult and pediatric oncology clinics, diagnostic radiology and mammography, radiation therapy, and an expanded Clinical Trials Unit. There are 101 examination, treatment, consultation and procedure rooms, three times the number in Gravely.

Multidisciplinary team care

People with cancer often need to be seen by physicians in different specialties, which can mean separate trips to separate appointments over several days or weeks. UNC has been a pioneer in minimizing the inconvenience—not to mention the delay in treatment—by enabling many patients to see all of their specialists in a single visit.

"A strong multidisciplinary program has been the hallmark of cancer care at UNC for a long time," says Joel Tepper, MD, Hector MacLean distinguished professor of cancer research and professor of radiation oncology at the UNC School of Medicine.

The main lobby of the N.C. Cancer Hospital

"Back 20-25 years ago, much of cancer care was sequential. Now, our patients are treated by a multitude of physicians working together in a coherent, organized and evidence-based fashion. In the new cancer hospital, we're going to have increased clinic and conference space, so it'll be much easier for people to get together, and it'll be easier for the patient to get the multiple consultations they need and to do it efficiently," he says.

"It is a wonderful way of caring for patients," says Shelley Earp, MD, director of UNC Lineberger. "It means that, as a patient, you are able to see a team of physicians, nurses and clinician researchers who come together to talk about your disease and design a specific treatment plan for you. And if you are eligible, they can enroll you in a clinical research project that gives you

The Pediatric Oncology Outpatient Clinic waiting area. Photo by Ethan Strickland

access to the newest therapies."

Because of the lack of space, multidisciplinary clinics for breast cancer patients have been held just one day a week, lung cancer clinics on another day and so on. That often made scheduling difficult.

"Now, we are able to expand those clinics and spread out our ability to see patients with our multi-disciplinary approach throughout the week," Earp says.

Radiation Oncology

Patients with many types of tumors are often treated with radiation therapy, either alone or in combination with chemotherapy or surgery.

"The new building gives us the ability to upgrade our technology so we can deliver treatments more accurately, and that should improve their effectiveness," says Larry Marks, MD, chair of the Department of Radiation Oncology.

The new hospital has three linear accelerators, the machines that deliver radiation. The machines will have the ability to deliver Intensity Modulated Radiation Therapy, as well as Image Guided Radiation Therapy. These tools allow radiation doses to be more accurately delivered to the target tissues and thus minimize risks to the adjacent healthy tissues.

"The new image guided technology allows us to do a CT scan of the tumor area while the patient is on the treatment machine," Marks explains. "By doing this, we can make sure the tumor is exactly where we think it is and deliver the radiation with great accuracy."

Among the advanced technologies available for treatment is the CyberKnife robotic radiosurgery system. It allows physicians to irradiate tumors virtually anywhere in the body with unprecedented precision, and because it is non-invasive, it can be used to treat tumors that cannot be removed by traditional surgery.

The radiation oncology section of the hospital includes a much larger brachytherapy suite. With brachytherapy, which is used primarily for certain gynecological cancers, radioactive capsules are temporarily implanted next to the tumor. The new brachytherapy suite is equipped to provide real-time imaging of the treatment area as the implants are being placed. This, Marks said, should allow procedures to be completed more quickly and with less patient discomfort.

Overall, the new hospital means that UNC's radiation oncologists will be able to see more patients, to see them faster and more efficiently, and to offer them the latest, most sophisticated treatment technologies. "It also will allow us to maintain our excellence and even expand our mission in research and education," Marks says.

Children's cancer care

The Pediatric Oncology Clinic has been in the same space for more than 20 years, but in that time, the number of patients seen in the clinic has more than doubled. "Our waiting room is so small that patients literally sit on the floor while they are waiting to be seen," says Stuart Gold, MD, professor and division chief of pediatric hematology and oncology.

The new hospital triples the amount of clinic space for evaluating and treating children with cancer. "It is absolutely spectacular," Gold says. "It's bright and cheery, it's up to date, and it gives us plenty of space to care for kids in the best way possible."

About one-third of pediatric oncology patients have some form of leukemia. Brain tumors are the most common type of solid tumors in children.

In the new clinic, there is an anesthesia machine in the "sedation room," where physicians perform what Gold referred to as "our uncomfortable procedures." "Anesthesiologists can now come over and put patients to sleep without using IVs, so more of the care we provide will be pain free," he says. The N.C. Cancer Hospital Pediatric Cancer Clinic will be one of the few in the country with this capability.

The clinic has a playroom, computer room and virtual reality machine. There is a TV and game station at every chemotherapy infusion chair. "It is going to be a place where patients and their families are much more comfortable and where days that can be very long seem shorter," Gold says.

Clinical trials

Next to the main chemotherapy infusion area in the cancer hospital is the Clinical Trials Unit, designed specifically for the care of patients who are participating in early phase tests of new drugs or drug combinations.

Clinical trials are not just part of the research mission of major cancer centers such as the N.C. Cancer Hospital; they are an integral component of patient care. Most of the pediatric cancer patients at UNC are in clinical trials, as are many adult cancer patients. "Participation in a clinical trial is the standard of care for many of our patients," said Claire Dees, MD, associate professor of hematology and oncology in the Department of Medicine and head of the cancer center's Phase One clinical trials research group.

"Despite all of the improvements in treatment over the last few decades, many people still die of their malignancies," she says. "So, clearly, new drugs and new approaches are needed."

Each year, UNC physicians enroll about 700 cancer patients in clinical trials. About 18 percent of those patients are in Phase One trials.

"Those are the earliest trials, where a new drug is being tested for perhaps the first time in people or being tested for the first time in combination with another drug," Dees explains. "It is very exciting and a novel idea, I think, to have patients who are participating in these clinical trials receiving their treatments right there on the same floor with other patients. The additional space will also allow us to do more clinical trials and involve more patients in trials in which we are evaluating the most exciting, most promising new anti-cancer drugs."

"Because we are establishing one of only two FDA-level drug evaluation units at an academic center and because we have such a superb faculty, more and more UNC is being seen as a place to test the really newest types of approaches," Earp added.

The Clinical Trials Unit will have its own laboratory for immediate processing of blood and patient samples. "The analysis will be performed in the School of Pharmacy, which has become a great partner in our drug development and early phase trial program," says Earp.

"Having those clinical research resources available, and easily available, will make it that much easier to offer those research options to the patients. And those research options are often the newest and the latest and most exciting things that are available for patients who really want options beyond the standard that is available anywhere," Tepper adds.

The state's commitment

The N.C. Cancer Hospital has been built because people across the state and their representatives in Raleigh recognized the critical need for a first-class public cancer care center. In 2004 the Legislature allocated $180 million to build the hospital and the adjacent Physicians Office Building. The decision to add the office building, conceived by former School of Medicine Dean Jeffrey Houpt, MD, former Hematology and Oncology Chief Beverly Mitchell, MD, and current Chief of Surgical Oncology Ben Calvo, MD, was very important. It allowed all of the space in the hospital to be directly applicable to patient care yet allowed expansion of UNC's oncology staff in offices just a three minute walk away.

Then, Hurricane Katrina struck the Gulf Coast, and the price of steel, concrete and other building materials went through the roof. Almost overnight, the cost to build the N.C. Cancer Hospital and doctors' offices shot up to $207 million.

Reducing the size of the project was not an option that anyone wanted to accept. So, the UNC Health Care System board decided to invest $27 million from its reserves to keep the hospital, in Earp's words, "exactly the way we wanted it," and to keep it debt free.

"The unwavering commitment and leadership of

A patient room. Photo by Les Lang

Deans Houpt and Roper and support from the Legislature and the UNC Health Care System has been extraordinary. UNC President Molly Broad and Chancellor James Moeser were very strong advocates also," Earp says. "Everyone realized that we already had a tremendous faculty and that we needed a world-class facility."

The UNC Lineberger Comprehensive Cancer Center has about 300 faculty members from a number of schools and departments across the campus. Chemists, biologists and physicists are working with nano-technology approaches to cancer therapy. Psychologists are involved in patient support programs. Computer scientists are working with cancer geneticists to mine huge new data sets. There are faculty based in the schools of pharmacy, nursing, public health and dentistry, and in the College of Arts and Sciences, in addition to clinical and basic scientists in the School of Medicine.

"We are an organization that is making discoveries in the laboratory that can be translated into patient care in a relatively short period of time," Earp says. "There are examples in which clinicians and scientists here at UNC are changing how the nation's doctors think about cancer and how patients are treated."

Telemedicine outreach

North Carolinians with cancer won't necessarily have to come to Chapel Hill to benefit from the expertise of UNC cancer specialists. Oncologists in Asheville and Wilmington and many places in between will be able to talk with UNC physicians about specific cases and view high-definition images of X-rays, CT scans and pathology slides.

Two conference rooms in the cancer hospital are equipped for telemedicine consultations, and UNC is spearheading the development of a statewide network of telemedicine facilities in hospitals and, eventually, some physicians' offices.

"As an academic medical center, our oncologists have the responsibility to become experts in a single or small group of diseases such as cancers of the breast, lung, prostate or colon," Earp says. "We want oncologists across the state, who generally see all types of cancer patients, to be able to access our physicians' specialized knowledge. Dr. Tom Shea, head of our Bone Marrow Transplant Program, is taking on this task of improving care across the state in his new role as UNC Lineberger's associate director for outreach programs."

Cancer survivorship project

Collecting medical information and even DNA and tumor tissue samples from about 10,000 cancer patients—and then analyzing all of that data to improve treatment—is the goal of the UNC Cancer Survivorship Cohort that UNC Lineberger is creating.

Basically, the idea is to develop a registry of the type of cancer each patient had, the kinds of treatment they received and what the outcome was. Then the patients, who will only be enrolled with their consent, will be contacted yearly to find out how well they are doing.

"If we make new discoveries about how your specific genes might affect your treatment, for example, we will be able to use that not only for research purposes, but we will be able to contact you again with your consent to incorporate new knowledge into your care," Earp says. "We think this is going to be a signature study of national import.'

Patient support services

It isn't surprising that a diagnosis of cancer and the treatment that follows can lead to depression or other mental health problems for some patients.

"We are able to provide expert help from a psychiatrist or other mental health professional to inpatients or outpatients who have depression, anxiety, confusion or a drug interaction problem," says Donald Rosenstein, MD, professor of psychiatry and director of the Comprehensive Cancer Support Program.

With the opening of the N.C. Cancer Hospital, Rosenstein says, "We are providing psychiatric care and psycho-social supportive care for cancer patients on an outpatient basis in a much more substantial way."

Rosenstein came to UNC in January after 17 years at the National Institutes of Health. One of his priorities has been establishing the Psycho-oncology Clinical Service.

Other cancer patient support services include symptom management clinics, nutrition counseling, a cancer resource center with educational materials and computers for online research, and integrative medicine services such as yoga, massage therapy, acupuncture and biofeedback. A boutique in the hospital has wigs, hats and scarves—available at no cost—to help patients look and feel better after their treatments.

The aim of all of the services under the Comprehensive Cancer Support Program umbrella, Rosenstein says, is to "integrate supportive care services so that we are tending to people in a thoughtful and caring way in addition to providing state-of-the-art cancer treatment."

University Cancer Research Fund

The growth of the clinician scientist faculty, the Cancer Survivorship Cohort, the plans to improve North Carolina's cancer outcomes, and research into how patients can be better-supported through a nation-leading psycho-oncology program are all supported by the University Cancer Research Fund established by the state in 2007. The fund started with an allocation of $25 million, and was increased last year to $40 million. Over 30 faculty members have been added to UNC with the fund's support across the spectrum of cancer research.

According to Earp, the impetus for creating the fund was a simple question: "Why not the best?"

"We had a wonderful faculty and were building this new, world-class hospital, and the legislature realized that with an additional investment UNC could create something very special," he said. "Our faculty could do even more to create knowledge at all levels, to reach out to the rest of the state, to study how different populations are treated for cancer, to improve detection in community settings, and to create materials from nanotechnology to detect cancer earlier, to turn basic knowledge of why cancer cells go awry into new drugs for untreatable diseases like pancreatic or advanced breast and colon cancer."

Dreaming big dreams

"The University Cancer Research Fund is allowing the faculty to dream the big dreams," Earp said. "It is allowing UNC to initiate the kinds of studies and innovative programs that attract and retain the best faculty and staff in the world.

"The new cancer hospital is tremendously important, but it is much more than the physical structure that makes UNC one of the really up-and-coming cancer centers in the country. Our university has a history of faculty collaboration for team research and a reputation for creating knowledge across boundaries. We live in an extraordinary place. With the resources provided by the Legislature, the governor, and the citizens of North Carolina, we will create new knowledge that provides better care for our patients, earlier detection, and better prevention for all North Carolinians."

From **bench** to **bedside** and **back**

The N.C. Cancer Hospital will enable UNC's physician-scientists to quickly move bench discoveries to clinical application—and treatment outcomes back to the bench.

BY MARGOT CARMICHAEL LESTER

To be sure, the N.C. Cancer Hospital will provide a state-of-the-art facility that creates a sleek, modern and comfortable location for patient care. But it also enables UNC's physician-scientists to pursue a much more robust and aggressive research agenda.

This combination of capabilities has Richard Goldberg, MD, excited. As the hospital's physician-in-chief, Goldberg is responsible for developing the facility's cancer care system, including overseeing multidisciplinary patient care and directing translational research. The hospital will set the standard, enabling physician-scientists to quickly move bench discoveries to clinical application—and treatment outcomes back to the bench.

"This will give North Carolinians unprecedented access to cutting-edge cancer therapies," he says.

Collaborative research and care

The hospital will leverage the integrated and collaborative research already being done at the UNC

Lineberger Comprehensive Cancer Center. "We are unique in the way clinicians and basic scientists interact in the halls of the cancer center on a daily basis and in the high percentage of clinically active physician scientists that are in our medical school departments," says Kim Rathmell, MD, PhD, assistant professor of medicine and genetics.

UNC's multidisciplinary approach is a very active partnership between the many individuals and services that are necessary to bring about the best level of cancer care. "This means we bring together in one clinic and at one weekly conference each member of the team—surgeons, oncologists, radiation oncologists, disease-specific pathologists, radiologists, genetic counselors, nurses, research coordinators, social workers, pastoral staff, and others—to discuss and formulate a plan for every new or complex patient. Now with the new center we will be able to work together in close proximity as well, and this close-knit network will become more transparent to patients undergoing their treatment process," says Rathmell.

The new facility, along with the University Cancer Research Fund, "will enable high-impact studies to happen more quickly," she says. "We will be able to develop clinically meaningful results that can be extended more immediately to improving the care of patients with cancer."

Better drug therapies

Several studies and trials are underway in an attempt to identify better drug therapies for all cancer types. For example, Rathmell's work with renal cell carcinoma and advanced disease includes molecular profiling, drug therapy and patient outcomes. "We're interested in bringing innovative treatments to patients who need them, and identifying patient or tumor attributes that might aid us in selecting the best treatment for an individual patient," she says.

She and her colleagues, urologic oncologists Raj S. Pruthi, MD, and Eric M. Wallen, MD, recently completed a study moving conventional therapy for advanced renal cell carcinoma into the pre-surgical setting, "so that we could examine the ability for this drug to shrink the primary tumor before surgery," she says. "We also are examining the role of conventional PET scans to predict response to different drugs conventionally used in renal cell carcinoma. And we have a study that examines tumors for molecular profiles that could, one day in the not-so-distant future, allow us to assign a prediction of risk for disease recurrence for patients and doctors facing the treatment or follow-up following resection of a renal cell carcinoma."

The team also is pursuing three drug trials. One uses a "novel and potentially very active" drug in combination with standard treatment for patients with renal cell carcinoma beginning their first treatment. The second—to be opened within the year—will combine conventional chemotherapy with a biologic agent for patients with very aggressive subtypes of this cancer. A third study will examine a novel drug combination for those patients who have failed prior effective therapies.

"These studies were selected specifically to have available innovative treatment options that complement the treatments that are available in the community with a realistic chance to benefit our patients," she says.

More effective care

Neil Hayes, MD, MPH, assistant professor of medical oncology and a member of the head and neck oncology team, values the opportunities the hospital provides for making advances in treatment. "For lung and head and neck cancers, the fatality rate is still quite high," he says. "We're certainly not happy with cure rates at 50 percent or below—we're trying to improve that."

His team currently has seven trials in various stages. "Some of our curative strategies can be very aggressive, so we'd like to be able to consider opportunities to have equal cure rates but with decreased toxicity," Hayes explains. "In cases where we can, we'd like to increase the probability that special treatment is tailored to cancer."

Dr. Kim Rathmell (above) and her research group are working on the understanding of the tumorigenesis of renal cell carcinoma.

The trials study three types of patients: those treated primarily with surgery, those treated with chemotherapy and radiation, and those whose tumors have returned after a curative therapy. "We're looking at thyroid cancer patients that are unresponsive to conventional therapy, and we are the only site in the southeast with trials open or about to open for patients with high-risk non-melanoma skin cancer.

"The new hospital will allow us to treat essentially every patient population we see with any frequency,"

Dr. Lisa Carey (center) working in the lab with Dr. Charles Perou (right) and postdoctoral fellow Dr. Katherine Hoadley. Perou's lab is aiming to develop improved therapies that are specific for each tumor subtype.

he says. "And even when cure is, unfortunately, not an expectation, we'll still be better able to pull together lots of resources for symptoms management to prolong life with good quality and coordinate complex care. You can't do that if you don't have the physical plant to accommodate the work. Now we will."

Valuable human studies

The ability to launch more clinical trials and human studies is key to solving the cancer conundrum.

But it also allows UNC to offer options to patients with late-stage cancers or those for whom other treatment has not been effective. Patients enrolled in these Phase One trials often go through the standard therapy without experiencing improvement, or have cancers for which there is no standard therapy.

"We've made a lot of progress in gastric, colorectal, and esophageal cancers that was only possible because people have agreed to take part in trials," Goldberg asserts. "Sometimes, participation benefits them because they get a great treatment that helps them. Other times, it's the generation after them that benefits because the avenue taken didn't turn out to be productive, but it led us to a new one that was."

The diagnosis and treatment of breast cancer is illustrative of the value of human trials. "Mortality has dropped by nearly 40 percent in the last 20 years," notes Associate Professor Lisa Carey, MD, medical director of the UNC Breast Center. "That benefit pie is divided up into pieces like mammograms, chemotherapy, anti-estrogen treatment, lumpectomy—lots of little 'singles' in there rather than a home run—but every single one arose out of clinical trials that showed it worked, and was beneficial. Name the one thing that's ever been shown to improve survival in breast cancer—the answer is clinical research."

Expanded lab capacity

Another factor driving trials and studies is new lab space, which will give UNC unprecedented ability to process specimens and test new compounds. A sample processing lab will be adjacent to the Clinical Trials Unit housed in the hospital. Outside the hospital, a state-of-the-art clinical pharmacology and drug development lab housed in the Genetics Medicine Building, and a Good Laboratory Practice (GLP) Analytical Facility located in Kerr Hall, also provide added capacity.

The sample processing lab will help researchers get better results faster because specimen handling will be easier and more streamlined. "In early trials we often take samples of blood or urine or skin or even gently scrape cells from the inside of the cheek to look at drug effects in those tissues," Goldberg says. "Those specimens have to be rapidly processed to give optimal results, and the adjacent lab will permit that."

The GLP enables UNC researchers to engage in preclinical and clinical pharmacologic studies of investigational agents in-house, dramatically reducing the amount of time it takes to vet and develop drug treatments. The lab also improves the likelihood that UNC will be included in studies of investigational agents, developed by the National Institutes of Health, the National Cancer Institute and pharmaceutical companies, that are submitted to the FDA as part of an Investigational New Drug study or a New Drug Application.

"Our GLP is one of only two such labs in an academic medical center in the country, so it's very rare," explains Bill Zamboni, PharmD, PhD, director of the GLP Analytical Facility and the Translational Oncology and Nanoparticle Drug Development Initiative (TOND.I) Lab, who leads the translational development of anti-cancer drugs at UNC. "We'll be able to bring resources to recruit

Participate in clinical trials

Interested in finding a clinical trial for yourself or one of your patients? Every clinical trial has guidelines about who can participate, and researchers follow protocols with defined criteria to identify participants and maintain safety standards. A regularly updated list of open clinical trials is posted at www.unclineberger.org. Additionally, a pipeline of trials is always in development, so if the trial needed is not posted, you can call the clinic director at (919) 966-4432 or toll free at 1-877-668-0683.

novel compounds or anti-cancer agents into UNC so we can open trials here. And that gives North Carolinians access to drugs and compounds they wouldn't otherwise be able to receive."

Earlier research opportunities

These studies will be performed in the cancer hospital's Clinical Trials Unit, where all trials and studies will be performed. "A lot of hospitals have clinical translational research centers—including UNC—but this is one of the few that's devoted specifically to cancer," Zamboni says.

In the unit, patients receive care from nurses and technicians who have oncology backgrounds, making the participants' experience more comfortable. And with the sample processing on site, the entire system of gathering, processing and analyzing specimens and data is uniform and efficient.

"It creates a seamless system," Carey says. "From a great idea developed at UNC or elsewhere, to early trials to final trials all under one roof."

The expanded capacity will allow UNC to participate in and perform more first-ever trials like the study of a compound that inhibits aurora kinase, an enzyme often overactive in cancer cells.

"Jen Jen Yeh, one of our laboratory researchers, has shown that this drug has significant potential to be active in pancreatic cancer where new drugs are desperately needed," Goldberg explains. "This is being done with Millennium Pharmaceuticals in Boston, and Dr. Claire Dees is the lead investigator. It's the first testing of this compound in humans with cancer."

Better research, better care

The N.C. Cancer Hospital opens a new chapter of UNC's research reputation, Rathmell says. "We will be entering the new hospital with mature and complete programs for every cancer type, ready to make major strides in how patients receive care for cancer both in North Carolina and nationwide," she says. "Opening the new cancer hospital is very symbolic of our enthusiasm and readiness to impact cancer care in a very positive way that we hope will be the paradigm for other cancer programs across the country."

Hayes encourages physicians around the state to think of the cancer hospital as an extension of their own practice. "We certainly enjoy our role as a referral center for helping colleagues across the state," he says. "Our goal is to get their patients back to their home communities as soon as possible."

Goldberg agrees, bringing it down to an even more personal level. "In the end, all cancer care and research is about helping human beings," he says. "And all of us have loved ones or friends and neighbors who have cancer. The new hospital is a place where we can take care of people in the way we'd want to be taken care of."

Thai Princess Maha Chakri Sirindhorn visits UNC

UNC's Dr. Stuart H. Gold, professor of pediatrics and chief of the Division of Pediatric Hematology/Oncology (foreground), leads Thai Princess Maha Chakri Sirindhorn (center) and her delegation on a tour of the N.C. Cancer Hospital. At right is Dr. Sumonta Promboon, a genetic scientist who is helping develop science education at all levels in Thailand. Photo courtesy of the Frank Hawkins Kenan Institute of Private Enterprise

Thai Princess Maha Chakri Sirindhorn visited the University of North Carolina at Chapel Hill May 24-27, 2009, hosted by the Frank Hawkins Kenan Institute of Private Enterprise. Her visit follows two decades of collaboration between UNC and the Thai government coordinated by the Kenan Institute's affiliate in Bangkok, Kenan Institute Asia. Deeply engaged in community, economic, and social development in her country, Her Royal Highness sought to learn more about the university that is helping create a sustainable future for Thailand and some of the education, health, and technology initiatives underway at UNC and the surrounding area. During her visit the princess and her delegation met with Dean of the School of Medicine and CEO of UNC Health Care Dr. William Roper, Vice Dean for Academic Affairs Dr. Etta Pisano, and UNC Health Care Senior Vice President for System Affiliations Mary Beck, and toured the N.C. Cancer Hospital and the UNC Lineberger Comprehensive Cancer Center

UCRF enhances recruitment of top-notch faculty

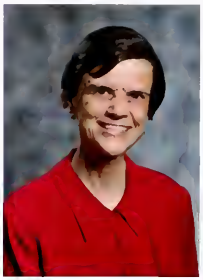
University Cancer Research Fund (UCRF) support has enabled UNC to attract top-notch faculty from across the nation. On this and the facing page are profiles of some of UNC's newest and brightest stars.

Lawrence Marks, MD
Radiation Oncology

Marks is professor and chair of the Department of Radiation Oncology and a member of UNC Lineberger Comprehensive Cancer Center.

His clinical interests are in the area of breast and lung cancer. His research interests are in radiation-induced normal tissue reactions and he has ongoing studies to consider radiation-induced injury to the lung and heart. He is also interested in the use of computer technology and three-dimensional radiation treatment planning to reduce the risk of injury from radiation therapy.

Marks earned his BS in chemical engineering from Coopers Union School of Engineering in New York, NY, and his MD from the University of Rochester in Rochester, NY. He completed his internship at Sinai Hospital of Baltimore, in Baltimore, Md., and his residency at Massachusetts General Hospital in Boston, Mass. Marks came to UNC in 2008 from Duke University, where he had been a member of the radiation oncology faculty since 1989.



Claire Doerschuk, MD
Lung Inflammatory Biology

Claire Doerschuk is professor of medicine and pathology and laboratory medicine and director of the Center for Airways Disease. She is a member of UNC Lineberger Comprehensive Cancer Center.

Doerschuk's research interests are in lung disease, particularly the mechanisms through which the lungs defend us against bacteria and inhaled toxins. Her work focuses primarily on bacterial pneumonia and the inflammatory and innate immune processes that defend normal and immunocompromised patients. She is also interested in

Outstanding alumni return to North Carolina

Thanks to UCRF support, two outstanding investigators have returned to North Carolina to help advance the state's cancer research agenda. Both Derek Chiang, PhD, and Paul Armistead, MD, PhD, first came to UNC as part of the highly-selective Morehead-Cain Scholars program, in which they both majored in chemistry.

Drs. Paul Armistead (left) and Derek Chiang.

Chiang went on to complete a PhD in molecular and cell biology at the University of California-Berkeley, where he was a Howard Hughes Medical Institute predoctoral fellow. He completed a post-doctoral fellowship at the Broad Institute in Cambridge, Mass. He has returned to UNC to work on computational tools to interpret the changes in tumor genomes, with the goal of understanding the genetic changes that cause cancer. He hopes that his research will help identify targets for individualized cancer therapy.

Armistead continued his education in the MD-PhD program at the UNC School of Medicine. He completed his residency in internal medicine at Brigham and Women's Hospital in Boston, Mass. He went on to do a fellowship in hematology and oncology and an instructorship in stem cell transplantation at the University of Texas MD Anderson Cancer Center in Houston. His work at UNC focuses on identifying and testing agents to help the immune system fight leukemia.

cigarette smoke-induced lung disease.

She earned her BA in mathematics from Wellesley College in Wellesley, Mass., and her MD from Rush University in Chicago, Ill. She completed her certification in pathology from the University of Chicago and completed a fellowship in experimental pulmonary pathology at the University of British Columbia Pulmonary Research Laboratory in Vancouver, British Columbia.

Catherine Fine, MS, CGC
Clinical Cancer Genetics

Catherine Fine is an assistant professor of genetics and a member of UNC Lineberger Comprehensive Cancer Center.

A certified genetic counselor in the Cancer and Adult Genetics Program, Fine meets with patients and families to provide genetic counseling for all types of cancer. She is interested in hereditary predispositions to cancer and rare genetic orders.

Fine earned her BA in biochemistry from the University of Colorado at Boulder and her MS in biophysics and genetics/genetic counseling from the University of Colorado Health Sciences Center in Denver, Colo.

Matthew Foster, MD
Leukemia and Lymphoma
Clinical Research

Matthew Foster is an assistant professor in the UNC Department of Medicine's Division of Hematology and Oncology.

His research interests involve developing new therapies for patients with leukemias and other disorders of the bone marrow. Foster is involved in the development and conduct of clinical trials of new drugs and new drug combinations for patients with blood cancers. Additionally, he is interested in clinical and genetic factors that predict response to chemotherapy for leukemias and myelodysplastic syndromes.

Foster earned his BA with honors in chemistry from UNC. He earned his MD degree from the UNC School of Medicine where he also completed his internal medicine residency and his fellowship in hematology-oncology.

Matthew Nielsen, MD
Urologic Oncology,
Outcomes Research

Matthew Nielsen is an assistant professor of surgery and urology in the School of Medicine and a member of the UNC Lineberger Comprehensive Cancer Center. He is also a fellow at the Cecil G. Sheps Center for Health Services Research at UNC.

In addition to treating patients, Nielsen conducts outcomes research using methods to assess quality of life and risk of recurrence for cancer survivors. He also studies treatment-related decision making and evaluates new molecular biomarkers for cancer detection.

Nielsen earned his BA at the University of Kansas and his MD at the Johns Hopkins University School of Medicine. He completed his residency at Johns Hopkins and a postdoctoral fellowship in pathology and urology at Johns Hopkins' Kimmel Cancer Center.

Angelique Whitehurst, PhD
Cancer Pharmocology,
Genome-wide RNA Screens

Angelique Whitehurst is an assistant professor in the Department of Pharmacology and a member of the UNC Lineberger Comprehensive Cancer Center.

Her research focuses on understanding the functional components supporting uncontrolled growth of cancer by employing a technique called small interfering RNA, which allows the selective silencing of individual proteins in tumor cells. Her work has helped to develop a screening test for certain genetic signatures that may indicate response to chemotherapy.

This analysis may help scientists and doctors understand how the presence of certain genes and the expression of particular proteins influence how effective chemotherapy is in killing cancer cells. The goal is to use these profiles to identify targets for new therapies that can kill cancer cells without damaging healthy cells.

Whitehurst earned her BS in biochemistry and her BA in chemistry at Virginia Tech and her PhD in cell and molecular biology at University of Texas Southwestern. She completed her postdoctoral fellowship at UT Southwestern in cell biology.

ROCK DOCS WITH A CAUSE

Six physicians have banded together to make music and hope to bring awareness of gynecological cancers to the masses

This article was written by Sarah Avery and originally appeared under the headline "Album will benefit gynecological cancer causes" in the January 30, 2009 edition of The News & Observer. *Reprinted with permission of* The News & Observer *of Raleigh, North Carolina.*

A rock 'n' roll fantasy is coming true for two surgeons at UNC Hospitals.

Drs. John Boggess and John Soper, who specialize in female reproductive cancers, are members of a six-person rock band that has signed a record deal with a small New York music label and is working with one of David Bowie's former producers to create an album.

The group, called N.E.D, for No Evidence of Disease, started a little over a year ago as a lark to spice up a scientific meeting. Now the members are scheduled to release a collection of original songs this fall, with proceeds benefiting gynecological cancer causes.

For the doctors, the fulfillment of their dream would be to sell a lot of discs—not so they can buy fast cars and romp with supermodels, but to raise needed money and awareness for devastating diseases they say get little attention.

"Do you ever see the words gynecologic oncology in print?" asked Boggess. The specialty treats cervical, ovarian and vaginal cancers, which afflicted an estimated 78,490 women in the United States last year. Compared with breast cancer, which hit 182,460 US women last year and raises millions of dollars in research money, Boggess said the gynecological cancers are often overlooked.

The band, he and Soper said, could change that. In addition to winning the record contract, the group has been invited to appear on daytime talk TV, "The Bonnie Hunt Show," and is discussing appearances on the "The

Left, N.E.D. is (from left to right) Dr. John Soper, UNC; Dr. Joanie Hope, NYU; Dr. William Robinson, Harrington Cancer Center, Amarillo, Texas; Dr. John Boggess, UNC; Dr. Nimesh Nagarsheth, Mt. Sinai Medical Center, New York, NY; and Dr. William Winter, Northwest Cancer Specialists, Portland, Ore.

Early Show" and "Good Morning America." They're gunning for an audience with Oprah.

It's a long way from their roots. The doctors—two others are from New York, one from Portland, Ore., and another from Amarillo, Texas—were patched together, Monkees-like, by a colleague who was arranging entertainment for an annual meeting of cancer doctors. Aside from Soper and Boggess, the band mates had never met, much less played together. They rehearsed one night, and performed the next—an hour's worth of classic rock covers.

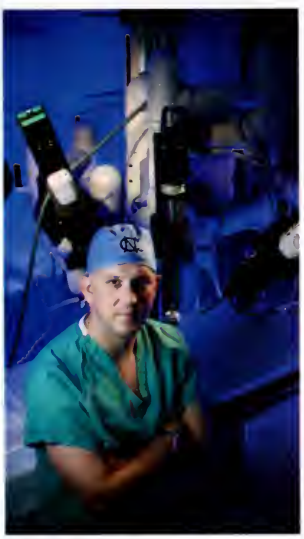
The goal, as Soper put it, "was to not suck."

That much was achieved.

"Everybody went crazy," said Marsha Wilson, communications director for the Gynecologic Cancer Foundation, the advocacy group that will benefit from the band's sales. "They were really good."

Old-school rockers

Most of the band members had played in groups during their younger days. Soper, who is in his mid 50s, played in bands in high school and college, and as an adult was a member of a local bluegrass group called Piney Mountain Boys, which split up in 1989 when the guy who owned the sound system moved away. While in medical school in Oregon, Boggess played in a band with other med students in the 1980s, earning steady rent money and a small following. But he gave up musical pursuits to practice medicine.



Boggess in his other life as a UNC student

It didn't take much cajoling to get the surgeons back in form. They played for another science gathering a few months after their debut, to equally rousing ovations and were then encouraged to write their own songs based on their experiences and observations treating cancer patients.

They came up with more than 20, and whittled the song list to about 10. Signed by Motéma, a small label that generally features jazz musicians, the band will record its album in New York in April. They're working with a musical coach to sharpen their sound.

"I responded to their writing and the fact that they put their life experiences in their music and that they were trying to make the world a better place," said Jana Herzen, founder and president of Motéma. "I think of music as food for the soul, and the doctors really are coming from this place."

Next week, the group returns to its origins and plays at the annual meeting of the Society of Gynecologic Oncologists, in San Antonio. After a full day of presentations about sentinel node biopsies and chemo-response assays, just about anything with a back beat might offer relief. But N.E.D. aims to be more than background noise, and in the process, give voice to illnesses that have for too long been quiet killers.

Editor's note: N.E.D.'s debut album is set for release on September 8, 2009, to coincide with Gynecologic Cancer Awareness Month and to help publicize the first annual Gynecologic Cancer Awareness Day and Race, which takes place on November 8th, 2009, in Washington, DC. Proceeds from the sale of the CD and live performances will be donated to the Gynecologic Cancer Foundation (GCF) whose mission is to educate the public about gynecologic cancers and support promising research. Specifically, funding donated to GCF by N.E.D. will support the new Gynecologic Cancer Awareness Movement (GCAM) to be launched in November 2009 in Washington, DC.

Medical Foundation celebrates 60th anniversary

The Medical Foundation of North Carolina, Inc. celebrated a milestone on May 28: 60 years of service the University of North Carolina at Chapel Hill's School of Medicine and UNC Hospitals. The Medical Foundation was chartered in 1949 as a 501(c)(3) charitable not-for-profit to address the growing need to raise private endowed funds for the school and hospitals.

The first meeting of the Medical Foundation was held in the Carolina Inn's "Faculty Club Room" on May 28, 1949. Notable attendees at this meeting included Dr. W. Reese Berryhill, dean of the School of Medicine, the Foundation's acting secretary, and member of its executive committee; L.P. McLendon, temporary president of the Foundation during its "planning stage"; Dr. H.O. Lineberger, member of the Foundation's executive committee; Henry A. Lineberger; Hyman Battle; and Dr. George Johnson.

To commemorate the occasion, The Medical Foundation held its spring Executive Committee meeting in the Club Room where the Foundation came into being exactly 60 years prior.

The Medical Foundation, one of the oldest foundations on the UNC campus, is responsible for raising private gifts to support programs throughout the School of Medicine and the UNC Hospitals. The Foundation manages nearly 1,100 individual accounts both for endowment and current operations purposes. Total Foundation assets stood at $234 million at the close of fiscal year 2008. Almost all of these funds are restricted to scholarships, professorships, research support and departmental funds. More than $110 milion was raised in fiscal year 2008 in the form of cash, deferred gifts and pledges for all areas of the School of Medicine and UNC Hospitals.

"The Foundation provides an invaluable resource that enables the school to do things it otherwise simply could not do," said Foundation President David Anderson. "We are fortunate to have had thousands of donors over the last 60 years who believe strongly in our missions of teaching new physicians, researching potential new cures, and providing compassionate patient care."

On its 60th anniversary, the Medical Foundation of North Carolina faces the most challenging fundraising environment in its history. But its generous donors and hardworking staff remain dedicated to the foundation's mission: "... to secure financial and volunteer resources for the UNC School of Medicine and UNC Hospitals to provide a healthier future through medical education, research, and patient care."

The Medical Foundation Executive Committee, 2009. Standing left to right are Foundation President and Ex Officio Director David Anderson, Dr. Stuart O. Bondurant, President of UNC Hospitals and Ex Officio Director Gary Park, and John W. Alexander. Seated left to right are Drs. John Foust, Hugh A. McAllister, Jr., George W. Cox, Mary S. Fulghum, and Mr. Richard T. Holderness. Photo by Paul Braly

A meeting of officers of the Medical Foundation of North Carolina, early 1950s. Seated left to right are Collier Cobb, Jr., Lennox P. McLendon, and George Watts Hill. Standing left to right are Drs. H.O. Lineberger, Harry L. Brockmann, William M. Coppridge, Paul Whitaker, and Shahane R. Taylor. UNC Photo Lab, NCC

Capps to leave $5 million to create two professorships

Thomas E. Capps, of Richmond, Va., is leaving $5 million in his will to the Medical Foundation to create two eminent professorships in the UNC School of Medicine's Division of Endocrinology.

The Capps Eminent Professorships in Diabetes will support diabetes research at UNC.

"The University of North Carolina at Chapel Hill means a great deal to me, and I am pleased to contribute to it in this way," Capps said.

Capps, a Wilmington, NC, native, graduated from UNC in 1958 with a bachelor's degree in English literature. He returned to UNC for law school, earning his juris doctorate in 1965. Now retired, he serves as a director of The Shaw Group, Inc., and is a former chairman of the board of directors, president and chief executive officer of Dominion Resources, Inc.

Boote gives gift for need-based patients in memory of son

Linda Boote, of Orange Beach, Ala., made a significant gift to the Medical Foundation in memory of her son, Joseph Gerritsen, who died at NC Memorial Hospital on June 12, 2008. Boote's gift will create an endowment to help "need-based" patients at the Hospital pay for their food and lodging.

Boote's son died of multiple complications, including pancreatitis, at age 39 and without insurance. Boote was grateful for the care Joe received during the three months he was at UNC Hospitals (April–June 2008), particularly his ability to stay in the hospital beyond the 21-day limit enforced in Alabama.

Boote recently became able to give back to the Hospital. "I have been blessed in being able to help others in his memory," she said.

Coach's blueberries raise funds for UNC Lineberger

Anyone can pick blueberries from UNC Women's Basketball coach Sylvia Hatchell's estimated 200 blueberry bushes at her cabin in Western North Carolina. All she asks is that pickers pay $5 a gallon and send their payment to UNC Lineberger Comprehensive Cancer Center.

Hatchell, who has a 540-202 record and one NCAA championship in 23 seasons at UNC, had a cancer scare in 2000 when ovarian tumors were found. They turned out to be benign, but the experience inspired Hatchell to give back to Lineberger.

"It's not a lot of money we raise, but it's for the people in this community who feel like they are giving something back by sending their $5 and $10 checks to Lineberger, and it's recognition for the cancer center," Hatchell told *USAToday*.

NC Lions raise $196,000 for UNC ophthalmology

The North Carolina Lions Club Foundation has given $196,000 to UNC's Department of Ophthalmology for the purchase of research and diagnostic imaging equipment. Travis A. Meredith, MD, chairman of the Department of Ophthalmology, acknowledged the gift at the NC Lions State Convention held last spring.

"[The gift] has already benefited thousands of our patients. Without the community support of our mission, we would be limited in the service we can provide to those who come to us for eye care. To all Lions and to our other donors, we extend our heartfelt appreciation," said Meredith.

The gift fully supported the purchase of an optical coherence tomography unit (OCT) and a fundus camera. The gift also provided the balance of funds needed to complete the fundraising for a RetCam, a special camera that allows the physician to obtain peripheral retinal images from the eyes of premature infants. The purchase of the RetCam was first made possible with two other grants from Prevent Blindness North Carolina and the A.E. Finley Foundation.

Kidney Center receives $4.7 million Gilman Estate bequest

Shirley Gilman's nieces Carmencita Conry and Marisa McLeod were patients at UNC in 1991 when Conry received a kidney transplant from her sister McLeod. Gilman's nephew Allan Brewster passed away during this time, and she established the Allan Brewster Memorial Fund in 1993 in his memory. The gift assisted those who would otherwise not be able to consider a transplant. The fund was used to help donors, recipients, and their families with transportation costs, accommodations and to cover financial losses from missing work. Gilman added to this gift for many years.

When Gilman passed away in 2008, she left $4.7 million of her estate to the Allan Brewster Memorial Fund to benefit the UNC Kidney Center. The gift will be used to help with kidney donor/recipient needs and will provide endowments to support several transplant programs at the Kidney Center.

Conry and McLeod revisited UNC in March for a celebration to recognize Gilman's family. During their stay, the sisters spoke about their transplant experience in a podcast with UNC Transplant Director Dr. Randy Detwiler. The podcast is available at http://tinyurl.com/lkctpn.

At a lunch the following day, Dr. Ronald Falk, director of the Kidney Center, thanked the family and spoke about how the funds will be used to promote kidney transplant and organ donation in North Carolina.

UNC researchers decode structure of entire HIV genome

The structure of an entire HIV genome has been decoded for the first time by researchers at the University of North Carolina at Chapel Hill. The results have widespread implications for understanding the strategies that viruses, like the one that causes AIDS, use to infect humans.

The study, the cover story in the Aug. 6, 2009, issue of the journal *Nature*, also opens the door for further research which could accelerate the development of antiviral drugs.

HIV, like the viruses that cause influenza, hepatitis C and polio, carries its genetic information as single-stranded RNA rather than double-stranded DNA. The information encoded in DNA is almost entirely in the sequence of its building blocks, which are called nucleotides. But the information encoded in RNA is more complex; RNA is able to fold into intricate patterns and structures. These structures are created when the ribbon-like RNA genome folds back on itself to make three-dimensional objects.

Swanstrom, Watts, Weeks and Burch. Photo by Lars Sahl, UNC

Kevin Weeks, PhD, a professor of chemistry in UNC's College of Arts and Sciences who led the study, said prior to this new work researchers had modeled only small regions of the HIV RNA genome. The HIV RNA genome is very large, composed of two strands of nearly 10,000 nucleotides each.

Weeks, who is also a member of the UNC Lineberger Comprehensive Cancer Center, and Joseph M. Watts, a chemistry postdoctoral fellow supported by UNC Lineberger, used technology developed by Weeks' lab to analyze the architecture of HIV genomes isolated from infectious cultures containing trillions of viral particles that were grown by Robert Gorelick, PhD, and Julian Bess of the National Cancer Institute.

They then teamed up with UNC researchers in the College and the School of Medicine for further analysis: Christopher Leonard in the Department of Chemistry; Kristen Dang, PhD, from biomedical engineering; Ron Swanstrom, PhD, a professor of microbiology and immunology at UNC Lineberger; and Christina Burch, PhD, an associate professor of biology. They found that the RNA structures influence multiple steps in the HIV infectivity cycle.

"There is so much structure in the HIV RNA genome that it almost certainly plays a previously unappreciated role in the expression of the genetic code," Weeks said.

Swanstrom and Weeks note that the study is the key to unlocking additional roles of RNA genomes that are important to the lifecycle of these viruses in future investigations.

"One approach is to change the RNA sequence and see if the virus notices," Swanstrom said. "If it doesn't grow as well when you disrupt the virus with mutations, then you know you've mutated or affected something that was important to the virus."

Weeks added: "We are also beginning to understand tricks the genome uses to help the virus escape detection by the human host."

The study was supported by the National Institutes of Health and the National Cancer Institute.

New drug shows promise for type 2 diabetes

A study led by UNC School of Medicine researchers has shown that the investigational new drug liraglutide taken once daily may be safer and more effective than currently available medications for people with type 2 diabetes.

The study was published in the online edition of *The Lancet* on Monday, June 8, 2009.

Although there have been important advances in the development of new therapies for type 2 diabetes, a need remains for safe and effective anti-diabetic medications. Currently available diabetes drugs that boost insulin secretion or heighten insulin sensitivity can lead to extremely low blood glucose levels, or hypoglycemia.

Liraglutide is a GLP-1 agonist, a new class of drugs that is fairly unique in diabetes as it is not only associated with glucose lowering but also weight loss. The drugs mirror the effects of naturally produced glucagon-like peptide-1 (GLP-1) which helps stimulate insulin secretion, reduces appetite and delays food absorption.

"If approved for use, liraglutide shows excellent promise to broadly improve many of the problems that most people with diabetes face – high blood sugar, overweight, high blood pressure and lipid problems," said study leader John B. Buse, MD, PhD, professor of medicine at UNC and past president of the American Diabetes Association.

Because GLP-1 analogs act to lower blood glucose only when levels are raised and not during periods of normal or low blood-glucose concentrations, the risk of developing

hypoglycaemia should be lower that that of many anti-diabetic drugs currently in use.

In this study of 464 people whose type 2 diabetes was poorly controlled with standard drug therapy, liraglutide was compared to exenatide, currently the only approved GLP-1 diabetes drug in the US.

"We demonstrated that liraglutide administered once daily was associated with greater blood glucose lowering, identical weight loss, less hypoglycemia, less persistent nausea as well as blood pressure lowering, and a modest benefit on blood lipid levels," Buse said

Estimates from the World Health Organization indicate that worldwide more than 170 million people have diabetes, of which type 2 diabetes accounts for about 90 percent of all cases. Prevalence is predicted to continue growing, fueled by rising rates of obesity

UNC study: Scientists identify chemical compound that may stop deadly brain tumors

Researchers at the UNC School of Medicine have identified a compound that could be modified to treat one of the most deadly types of cancer, and discovered how a particular gene mutation contributes to tumor growth

The findings and potential treatment apply to a type of brain tumor called secondary glioblastoma multiforme (GBM). GBMs are part of a larger group of brain tumors called malignant gliomas, the type of cancer from which US Senator Edward Kennedy suffers

A report of the research appeared in the April 10, 2009, issue of the journal *Science*. In experiments with tumor cells, the researchers reversed the effects of a mutation in a gene called isocitrate dehydrogenase-1 (IDH1) by replenishing a compound called α-ketoglutarate (α-KG).

"When the IDH1 gene is mutated, the level of α-KG is reduced, which in turn contributes to tumor growth by helping to increase the supply of nutrients and oxygen to tumor cells. When we added the α-KG to tumor cells, the effects caused by the IDH1 mutation were reversed," said Yue Xiong, PhD, William R. Kenan Jr. distinguished professor of biochemistry and biophysics and a member of the UNC Lineberger Comprehensive Cancer Center.

"If scientists can develop α-KG into a clinical drug, it could potentially be used for treating brain tumor patients who have this specific gene mutation. The α-KG compound is already there; it only needs to be modified to be used clinically, so that may save a lot of time." Xiong said

Xiong is a corresponding author of the study along with Kun-Liang Guan, PhD, professor of pharmacology at the University of California, San Diego

The findings and potential treatment apply mostly to secondary GBM rather than a different type of tumor called primary GBM. About 75 percent of secondary GBMs have mutations in the IDH1 gene, but only 5 percent of primary GBMs have this mutation, Xiong said. Even though these two types of GBM have a similar end result, the tumor types develop in very different ways, and doctors will need very different treatments to stop them.

The first author of the *Science* paper is Shimin Zhao, PhD, of Fudan University in Shanghai, China. Zhao and students in his lab made key contributions to the research, Xiong said. Those students, also authors on the paper, are Yan Lin, Wei Xu, Wenqing Jiang, Zhengyu Zha, Pu Wang, Wei Yu, Zhiqiang Li, Lingling Gong, Yingjie Peng, Jianping Ding and Qunying Lei

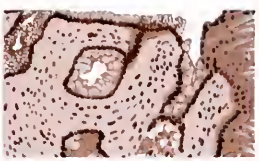
Xiong and Guan helped develop the lab at Fudan University and supervise graduate student training and project development there.

Xiong and his colleagues are continuing studies of other effects of the IDH1 mutation and are developing a mouse model of secondary GBM that could be used to test the potential treatment.

The current study was supported by the National Institutes of Health, the Chinese Ministry of Education, State Key Development Programs of China, National 863 Program of China, China NSF grants and Shanghai Key Basic Research Projects.

Landmark UNC-led study finds radiofrequency ablation is effective treatment for Barrett's esophagus

A landmark clinical trial led by a UNC researcher concludes that radiofrequency ablation is an effective treatment for dysplasia in people with Barrett's esophagus, a condition that can lead to deadly gastrointestinal cancer.



"These results show there is a substantial difference between treatment with radiofrequency ablation and a placebo or 'sham' treatment," said Nicholas Shaheen, MD, principal investigator of the study, associate professor in the UNC School of Medicine and the UNC Gillings School of Public Health and director of UNC's Center for Esophageal Diseases and Swallowing. "It's a strongly positive finding."

The study was published in the May 28, 2009 issue of *The New England Journal of Medicine*. A related editorial published with the study calls it "a landmark study in the field."

Barrett's esophagus is a condition in which repeated acid reflux causes the cells that line the esophagus to be replaced by a different type of cell, similar to those normally found in the intestines. This process is called intestinal metaplasia. By itself Barrett's is not life-threatening, but a small percentage of people with Barrett's will develop esophageal adenocarcinoma, an especially deadly form of cancer

Radiofrequency ablation (RFA), a non-invasive technique that uses thermal energy, or heat, to destroy cells, is very effective at destroying abnormal cells in the esophagus. The new UNC-led study is the first randomized trial to evaluate radiofrequency ablation for treating dysplasia, a more advanced stage of Barrett's esophagus in which the abnormal

cells acquire precancerous traits.

The RFA system used in the study uses thermal energy provided by a set of electromagnetic coils on the surface of a balloon, Shaheen said. "The balloon is placed in the area of the esophagus where the offending cells are and the balloon is inflated. Energy is then passed through the electromagnetic coils and, because we know how far apart the coils are spaced and how much energy is being put through them, we get a very reliable depth of burn, such that you can kill the abnormal cells on the inner surface without damaging the whole organ."

In the study, 127 people were randomized to receive either radiofrequency ablation or a simulated, "sham" version of the procedure at one of 19 participating medical centers. Among those with low grade dysplasia who received radiofrequency ablation, 90.5 percent were free of dysplasia 12 months after treatment, compared to 22.7 percent in those who received the sham procedure. Among those with high grade dysplasia, 81 percent who received radiofrequency ablation had complete eradication of intestinal metaplasia, compared to 19 percent in the sham group.

Overall, 77.4 percent of study participants treated with RFA had complete eradication of intestinal metaplasia, compared to 2.3 percent in the sham group. There was also less progression towards disease in the RFA group, 3.6 percent vs. 16.3 percent, and significantly more sham subjects developed esophageal adenocarcinoma, 9.3 percent vs. 1.2 percent.

The study concluded that RFA demonstrated a high rate of eradication of dysplasia and intestinal metaplasia and that these changes reduced the risk of progression towards dysplasia and the risk of developing cancer.

Funding for the study was provided by BARRX Medical Inc., which manufactures the HALO360 radiofrequency ablation system used in the study, the Investigator-Sponsored Study Program of AstraZeneca and a grant from the National Institutes of Health.

For more information about Barrett's esophagus, visit http://digestive.niddk.nih.gov/ddiseases/pubs/barretts/.

UNC scientists identify growth factor as possible cancer drug target

To grow and spread, tumors need new blood vessels, a process called angiogenesis. One growth factor that causes angiogenesis has been identified—vascular endothelial growth factor (VEGF)—and drugs to inhibit VEGF are already in use. But not all tumors respond to the therapy initially or over the long term. Thus new growth factors need to be identified to aid in developing the next generation of angiogenesis inhibitors.

Scientists at the UNC Lineberger Comprehensive Cancer Center report finding a new angiogenesis protein, SFRP2, found in the blood vessels of numerous tumor sites, including breast, prostate, lung, pancreas, ovarian, colon, kidney tumors, and angiosarcomas. The scientists found that SFRP2 is a potent stimulator of angiogenesis. This protein may be a favorable target for inhibiting angiogenesis which would then "starve" the tumor of its blood supply, thus destroying the cancer.

"The discovery that SFRP2 stimulates angiogenesis and is present in blood vessels of a wide variety of tumors provides us with a new target for drug design," said Nancy Klauber-DeMore, MD, senior author. The study was published online in the journal Cancer Research. Klauber-DeMore is associate professor of surgery and a member of UNC Lineberger Comprehensive Cancer Center.

Based on the UNC-led team's understanding of how this protein works in the blood vessels, scientists successfully utilized a drug, tacrolimus, which is commonly used to prevent organ transplant rejection, to inhibit the growth of angiosarcoma in pre-clinical studies. Angiosarcoma is a highly aggressive cancer that begins in the cells lining the blood or lymph vessels for which options for therapy are limited.

Klauber-DeMore, as part of her medical training, completed a surgical research fellowship in the laboratory of Dr. Judah Folkman at Children's Hospital in Boston. Folkman founded the field of angiogenesis research. Klauber-DeMore worked with colleagues at the UNC Lineberger Comprehensive Cancer Center, the Carolina Cardiovascular Biology Center, and the Department of Dermatology at Emory University School of Medicine and the Atlanta VA Medical Center.

Test detects molecular marker of aging in humans

In 2004, researchers at UNC Lineberger Comprehensive Cancer Center announced a crucial discovery in the understanding of cellular aging. They found that as cells and tissues age, the expression of a key protein, called $p16^{INK4a}$, dramatically increases in most mammalian organs. Because $p16^{INK4a}$ is a tumor suppressor protein, cancer researchers are interested in its role in cellular aging and cancer prevention.

Sharpless

Now the team has proven that the same biomarker is present in human blood and is strongly correlated both with chronological age and with certain behaviors such as tobacco use and physical inactivity, which are known to accelerate the aging process.

In a paper published online ahead of print in the journal Aging Cell, the researchers reported that they have solved technical hurdles to develop a simple blood test to detect $p16^{INK4a}$ expression, which is present in cells called T-lymphocytes, also known as T-cells.

"This is a major step toward a practical tool to clinically determine a person's actual molecular, as opposed to just their chronological age," said UNC Lineberger member Norman Sharpless, MD, the senior author of the study and associate professor of medicine and genetics at UNC's School of Medicine.

They validated the test by obtaining blood from two groups of healthy human volunteers, totaling 170 subjects,

who also filled out a questionnaire about current and past health status and health behaviors.

They found that expression of the biomarker was strongly correlated with the donor's chronological age and, in fact, increased exponentially with age. In addition, increased levels were independently associated with tobacco use and physical inactivity as well as with biomarkers of human frailty.

Sharpless said that the researchers were surprised by some of their findings. "We found a very weak correlation between the biomarker and obesity—as measured by body mass index (BMI)—despite other data suggesting that caloric restriction slows aging. The data suggest the possibility that reduced exercise may actually be worse with regard to molecular age than a higher BMI."

"Although we don't know whether this test is a good reflection of cellular age in all types of human tissues, we believe it is a first step toward a better understanding of issues like the suitability of organs for transplantation, how well patients are likely to recover after surgery or the future toxicity of chemotherapy for cancer patients," he added.

Along with Sharpless, study co-authors from UNC Lineberger are laboratory technician Chad Torrice, postdoctoral researchers Yan Liu, Hyunsoon Cho and Christin Burd, and UNC Lineberger members Hanna Sanoff, MD, assistant professor of medicine, Nancy Thomas, MD, PhD, associate professor of dermatology, and Joseph Ibrahim, PhD, alumni distinguished professor of biostatistics at UNC's Gillings School of Global Public Health.

This work was supported by grants from the National Institutes of Health, the Ellison Medical Foundation and the Burroughs Wellcome Fund

UNC scientists tackle viral mysteries

Scientists know that some cancers are triggered by viruses, which take over cellular systems and cause uncontrolled cell growth. Doctors—and patients who get shingles late in life—have also known for many years that some viruses, particularly the herpes virus, can lie dormant in a person's cells for long periods of time and then reactivate, causing disease. These viruses also cause significant disease in immunosuppressed people and those living with HIV/AIDS.

A recent study led by Blossom Damania, PhD, associate professor of microbiology and immunology at UNC, focuses on the intersection of these two scientific puzzles, resulting in new discoveries about how one herpesvirus known to cause cancer may reactivate when the infected cell senses another type of virus entering it.

Damania, who is also a member of the UNC Lineberger Comprehensive Cancer Center, focused on Kaposi's sarcoma-associated herpes virus (KSHV), an agent associated with Kaposi's sarcoma, primary effusion lymphoma and another syndrome called Castleman's disease.

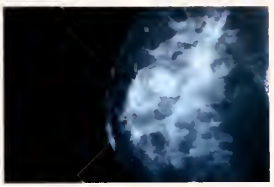
"We hypothesized that a secondary viral infection could serve as the trigger for KSHV, so we took cells infected with KSHV and activated immune receptor proteins called toll-like receptors that are present on the body's cells. Toll-like

Study shows chemotherapy improves survival among older breast cancer patients

The average age of a woman diagnosed with breast cancer is 63, so it is critical to have effective and proven therapies for an older patient population. But older women with breast cancer are underrepresented in clinic trials, so there is little data on the effects of chemotherapy used in addition to other therapies such as surgery.

A new study, published in the May 14 issue of *The New England Journal of Medicine*, shows that chemotherapy in addition to the surgery or surgery and radiation improves survival among older women.

The study was conducted with 600 women through the Cancer and Leukemia Group B of the National Cancer Institute's Clinical Trials Cooperative Group Program.



"This study is important because it is among the first several trials specifically targeted to older women with early-stage breast cancer and shows that chemotherapy can make a difference," said Hyman Muss, MD, professor of medicine at the UNC School of Medicine and a member of UNC Lineberger Comprehensive Cancer Center, and corresponding author on the study.

The study compared a combination of chemotherapy drugs—the standard treatment—to a single drug in patients with early-stage breast cancer aged 65 and older. The combination therapy provided significantly better outcomes than a single drug treatment.

Similar studies involving women younger than 70 years of age have also shown that combination therapies provide better outcomes.

For this trial, the standard chemotherapy consisted of either cyclophosphamide, methotrexate, and fluouracil (CMF) or doxorubicin plus cyclophosphamide. The single drug was the oral drug, capecitabine.

Because patients often prefer oral to intravenous chemotherapy, a new effective oral agent for multi-drug treatment would be useful in treating older women with breast cancer. But the study showed that patients who were randomly assigned to capecitabine were twice as likely to have a relapse, and at three-years after completing therapy, the rate of relapse-free survival was 68 percent in the capecitabine group versus 85 percent in the standard-chemotherapy group.

The multi-institution trial included faculty from UNC Lineberger and Duke University, as well as clinical trials cooperative groups and institutions across the US and Canada

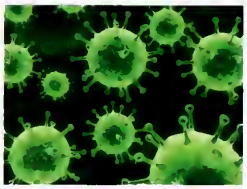
receptors are the guardians of the cell and essentially function to alert the cell to the presence of an intruder. These proteins act as an alarm system to tell the cell that a foreign organism is trying to enter it," said Damania.

Ten human toll-like receptors have been identified by scientists thus far, but the UNC team found that activation of only two of them, TLR7 and TLR8, reactivated the virus, allowing it to reproduce itself. The cells self-destruct in an attempt to kill the virus, but by the time the cell dies, the virus has already replicated and escaped, moving on to infect other cells in the body.

"This is a very exciting finding because it helps us better understand how a latent virus can suddenly reactivate, replicating and spreading throughout the body. Additionally, since Kaposi's sarcoma is a cancer that is associated with this phase of viral infection, it is plausible that the virus' activation and replication may eventually lead to the development of Kaposi's sarcoma in an infected individual.

"Laboratory experiments in a controlled research environment often do not reflect the real world, where we are constantly exposed to many different environmental factors and other microorganisms. This finding is an important reminder that multiple factors are involved in causing disease," she added.

The research was published earlier this year in *Proceedings of the National Academy of Sciences*. Study co-authors from the UNC Lineberger Comprehensive Cancer Center include first-author Sean Gregory, graduate student; John West, PhD, postdoctoral fellow; Patrick Dillon, PhD, postdoctoral fellow; and Dirk Dittmer, PhD, associate professor of microbiology and immunology.



This work was supported by the National Institutes of Health, the Leukemia and Lymphoma Society, and the Burroughs Wellcome Fund. Damania is a Leukemia and Lymphoma Society scholar and a Burroughs Wellcome Fund investigator in infectious disease.

Study identifies cause of breast cancer's most common form

The discovery of tumor-suppressor genes has been key to unlocking the molecular and cellular mechanisms leading to uncontrolled cell proliferation—the hallmark of cancer. Often, these genes will work in concert with others in a complex biochemical system that keeps our cells growing and dividing, disease free.

Now researchers at the UNC School of Medicine and UNC Lineberger Comprehensive Cancer Center have found that defects in one gene, called p18, may override the rest, eventually leading to cancer.

This discovery, combined with new laboratory techniques will help scientists identify and test new treatments for luminal-type tumors, which account for between 70 and 80 percent of all breast cancers, but are generally slower growing than other types.

The results of the research appeared in the May 2009 issue of *Cancer Cell*.

Defects in the p18 gene have been observed in different types of human cancer. Senior study author Yue Xiong, PhD, William R. Kenan Jr. Distinguished Professor of biochemistry and biophysics, observes, "When this gene is not expressed or is deleted, cells have no braking mechanism. They will continue to grow and divide until they turn into cancer."

Xiong and his colleagues specifically targeted the role that p18 plays in the development of luminal breast cancers. Using genetically-engineered mice with deletion of p18 genes, they created a highly reliable model of human breast cancers. The researchers tested their model by analyzing the gene in samples from approximately 300 human breast cancer patients, proving that the decreased expression of the p18 gene is highly correlated with the development of luminal tumors.

"The mechanism behind these tumors is quite different from that of other forms of breast cancer. Understanding this mechanism and having a good mouse model allows us to specifically test how treatments work against these tumors, which may then benefit human patients," said Xiong.

The research was supported by the National Cancer Institute Breast SPORE program, the National Institutes of Health and the Breast Cancer Research Foundation.

Study co-authors from the UNC Lineberger Comprehensive Cancer Center include Xin-Hai Pei, PhD research assistant professor; Feng Bai, MD, PhD, research associate; Matthew D. Smith, research specialist; Jerry Usary, research associate; Cheng Fan, research associate; and Charles M. Perou, PhD, associate professor of genetics and pathology and laboratory medicine.

Research uncovers clues to virus-cancer link

In a series of recently published articles, a research team from UNC Lineberger Comprehensive Cancer Center has uncovered clues to the development of cancers in AIDS patients.

In an April article published in the journal *PLoS Pathogens*, Dirk Dittmer, PhD, associate professor of microbiology and immunology at UNC's School of Medicine, demonstrated that the Kaposi sarcoma associated herpesvirus (KSHV) is not only present in every tumor cell, but that the cells also transcribe microRNAs (miRNA) from the virus. This represents a collaborative effort between UNC researchers and clinicians at Beth Israel Hospital, the University of Miami and the Federal University in Bahia, Brazil.

MicroRNAs are small molecules that regulate gene expression. Scientists have hypothesized that viruses can cause cancer through a mechanism where the viral genes take over the cell and induce cancerous growth through alteration of cell miRNA, since certain kinds of miRNA are responsible for putting the 'brakes' on uncontrolled cell growth.

Dittmer's team examined samples of tissue provided with the consent of Kaposi's sarcoma patients and found

that specific miRNA biomarkers accurately identify stages of tumor progression. They found that certain miRNAs were lost as the tumors progressed, effectively accelerating the cancer's growth. More aggressive tumor stages expressed higher levels of KSHV miRNA.

In second study, published June 4 in the journal *Blood*, the team looked for the presence of tumor suppressor mRNAs in primary effusion lymphoma and Kaposi's sarcoma.

"We chose these two cancers because, while they are both associated with the same virus, they occur in very different types of cells," Dittmer noted.

His team found that several miRNAs known to suppress tumor activity were significantly less active in both types of cancer.

"Micro RNAs are an exciting new class of cancer markers. Knowing which ones are present in a particular tumor will help us understand the biology and develop those micro RNAs as novel cancer therapy targets."

Scientists believe that finding the mechanisms through which viruses take over cellular systems, resulting in cancer, is a promising strategy for cancer prevention and treatment, since it is much more feasible to block viral infection or develop specific inhibitors of the viral genes than try to inhibit all of the genetic changes within a cancer.

This work was supported by the Leukemia and Lymphoma Foundation, the University Cancer Research Fund, the AIDS Malignancies Clinical Trials Consortium and the National Institutes of Health.

University Cancer Research Fund creates winning breast and prostate cancer research partnership

A disagreement between Nancy Allbritton, MD, PhD, and David Lawrence, PhD, over which cancer—breast or prostate—should be the higher priority in their partnership resulted in two successful NIH grant proposals. Lawrence is taking the lead on a prostate cancer grant while Allbritton leads a breast cancer grant—totaling almost $5 million over the next five years.

Allbritton moved to UNC from the University of California at Irvine, and Lawrence from the Albert Einstein College of Medicine in New York.

They decided to come to UNC for similar reasons—a top-notch chemistry department that meshed well with their interests, an outstanding medical school, and a first-rate cancer center. Both of them are members of UNC Lineberger Comprehensive Cancer Center in addition to their appointment in the College of Arts and Sciences and both were looking for research partners. Allbritton notes, "Most of my work is very interdisciplinary and depends on high quality collaborations with clinicians and basic biomedical scientists."

Soon after their arrival, they realized that their research interests overlapped. Although they were aware of each other's work, "It was the first time we had ever met," said Lawrence, who, in addition to his appointment in chemistry, is a Fred Eshelman Distinguished Professor in the UNC Eshelman School of Pharmacy. "We have very similar interests but bring to the table different tools to attack the biological problems that interest us. Nancy really knows how to manipulate and design analytical chemistry technology in a way that goes beyond the frontiers of science. I do the same thing, but at the molecular level."

Allbritton asked Lawrence to discuss a possible collaboration over lunch, which he accepted, joking, "How could I say no when she was paying?" For her part, Allbritton is happy that a simple lunch 'bribed' Lawrence to participate in a scientific collaboration that is now paying huge dividends thanks to an investment by the University Cancer Research Fund (UCRF).

They both credit UCRF with providing the opportunity to turn that lunch conversation into a reality. They asked themselves, "Wouldn't it be great not only to tell whether a patient has cancer (or that it has returned) with a simple blood test, but also to be able to tell that patient which combination of cancer drugs will work? In short, we could know in six hours rather than six months whether a particular drug regimen will be effective." The pair went on to invent a tool to do just that for leukemia—the first target of their research.

Once they proved their concept, this dynamic duo faced a disagreement over where to next test their strategy. "Nancy felt we should turn our attention to breast cancer, whereas I felt prostate cancer rated a higher priority," Lawrence noted (with tongue firmly in cheek). Their agreement to disagree resulted in two successful NIH grant proposals, with Lawrence taking the lead on the prostate cancer grant and Allbritton leading the breast cancer grant—totaling almost $5 million over the next five years.

"While breast and prostate cancer are very different in many ways, both are nearly impossible to treat after they have metastasized," said Lawrence.

Allbritton (left) and Lawrence

The UCRF funding "really jump-started the collaboration," says Allbritton. But the scientists hope that the return on this investment will be much greater than the sum of their NIH grants. Their goal: to give clinicians another weapon in the early-detection arsenal and a tool to create personalized treatment for many different cancers.

UNC Lineberger physicians and scientists are teaming with them to realize this goal. Breast cancer experts Channing Der, PhD, and Jen Jen Yeh, MD, and prostate cancer expert Young Whang, MD, PhD, are collaborating on the grant.

Children's Hospital, three UNC Health Care specialties, and UNC medical school ranked among nation's best

NC Children's Hospital is one of the best children's hospitals in the nation, according to US News Media Group's 2009 edition of *America's Best Children's Hospitals*, the most extensive listing of its kind.

The publication has recognized NC Children's Hospital as 11th in the nation among those caring for children with respiratory disorders. The ranking is online at www.usnews.com/childrenshospitals and is featured in the August issue of *USNews & World Report*.

"This marks the second consecutive year that NC Children's Hospital attained the highest ranking of any children's hospital in the state," said Dr. Alan Stiles, the Children's Hospital's chief physician and chair of pediatrics at the UNC School of Medicine. "Families across North Carolina can rest easy knowing that ... their children have access to world-class care at one of the best children's hospitals in the entire country—not only here in Chapel Hill but at more than 25 satellite clinics throughout the state."

Hospitals are ranked in 10 specialty categories: cancer, diabetes and endocrine disorders, digestive disorders, heart and heart surgery, kidney disorders, neonatal care, neurology and neurosurgery, orthopedics, respiratory disorders, and urology.

NC Children's Hospital's latest ranking further distinguishes UNC Hospitals, which has been included in *USNews & World Report's America's Best Hospitals* rankings for the last 16 years in a row.

Three UNC Health Care specialties ranked

This year's rankings include three UNC Health Care medical specialties among the best in the country: The specialties, and their rank, are: Cancer, 37; Kidney, 28; Gynecology, 24. Gynecology saw the largest move, up nine spots from No. 33 last year.

"These rankings are an important measure of excellence," said Dr. William L. Roper, CEO of UNC Health Care and dean of the UNC School of Medicine. "These specialties deserve congratulations, as do all of the UNC faculty and staff who provide excellent care to our patients."

More than 1,800 hospitals around the country are considered for the rankings; only 174 received scores high enough to be included in the rankings. Rankings rely on data from a three-year running average; many of this year's scores were based on Medicare data from 2005, 2006 and 2007.

The rankings are one of the latest awards for UNC. Patients recently acknowledged UNC as the best hospital in the Triangle for patient satisfaction in eight of 10 categories, third among American academic medical centers and in the top 10 percent of all hospitals in the country, according to the Hospital Consumer Assessment of Healthcare Provider Systems survey (HCAHPS).

Roper said while UNC has an eye on improving the magazine's rankings, "our primary responsibility is—and will continue to be—the discovery and implementation of improvements to medical care, the education of future physicians and our service to the people of North Carolina."

UNC School of Medicine ranks second in primary care

UNC is second among all schools on the magazine's list of primary care med schools, and 20th among all research med schools and sixth among public schools in that category.

Three specialties ranked among the top 10: Family medicine, second; Rural medicine, sixth; AIDS, ninth.

"We are proud once again to be listed among the best medical schools in the country," says Roper.

"These *USNews & World Report* rankings are one measure of our excellence, and they reflect what we at UNC already know, that we strive every day to deliver the best medical education in the country. Our faculty and staff, as well as our students and alumni, bring great credit to us all."

The rankings were published in the May issue of *USNews & World Report's Best Graduate Schools* issue.

Shea to chair national bone marrow advisory committee

Thomas Shea, MD, has been voted chair-elect of the Scientific Advisory Committee for the Center for International Blood and Marrow Transplant Research (CIBMTR). He will serve one year as chair-elect before starting a two-year term as chair in 2010. The committee establishes policy for, and provides scientific direction to, the center.

Shea is director of the UNC Bone Marrow and Stem Cell Transplantation Program and associate director of clinical outreach for UNC Lineberger Comprehensive Cancer Center.

The CIBMTR collects and stores data from over 400 transplant centers and 280,000 patients worldwide and makes it openly available to interested research investigators and to the public. It is one of the world's largest clinical databases of blood and marrow transplantation outcomes and is also involved in the design and conduct of clinical studies involving large numbers of patients from multiple transplant centers.

UNC's Bear named a HHMI Early Career Scientist

James Bear, PhD, associate professor of cell and developmental biology in the UNC School of Medicine, has been selected to receive a Howard Hughes Medical Institute Early Career Scientist Award.

Bear

Bear, a member of the UNC Lineberger Comprehensive Cancer Center, will receive a six-year grant to fund his research into proteins associated with cell motility and melanoma.

Vytas Bankaitis, PhD, professor and chair of the cell and developmental biology department, said the institute could not find a more deserving awardee than Bear. "As chair, I find it personally gratifying that the HHMI chose to make this prestigious award to Jim because his recruitment to and development as an independent scientist within UNC testifies to the long-standing 'bottom-up' philosophy that makes UNC great—that is, to invest in talented young basic scientists with the confidence that such investments will blossom."

Shelley Earp, MD, director of the Lineberger Center, said Bear's award was a tremendous honor for him and for the University. "The Howard Hughes Medical Institute selects only the best and brightest scientists to fund. Jim's fundamental and advanced live cell microscopy techniques are probing the mysteries of cell motility and tumor cell metastases. His findings have the potential to help clinicians understand how to treat diseases such as melanoma and glioblastoma."

Bear came to UNC in 2003 following a postdoctoral fellowship at MIT in the laboratory of Frank Gertler. He earned his undergraduate degree in biology from Davidson College in Davidson, NC, and his doctoral degree in cell and developmental biology from Emory University. From 2001-2004, he was a Leukemia & Lymphoma Society Special Fellow.

The institute's Early Career Scientist awards identify the nation's best biomedical scientists at a critical early stage of their faculty careers, and provide them with flexible funding to develop scientific programs of exceptional merit. Bear is one of 50 researchers in the US selected by the institute this year.

Pagano appointed to FDA Science Board

Joseph S. Pagano, MD, Lineberger professor of cancer research and director emeritus of the UNC Lineberger Comprehensive Cancer Center, has been appointed to a four-year term on the Science Board of the Food and Drug Administration (FDA).

Pagano

The FDA Science Board provides advice, primarily to the FDA Commissioner and other officials, on specific complex and technical issues, on emerging issues within the scientific community, and on formulating appropriate research agendas. It will also provide the means for critical review of Agency-sponsored intramural and extramural scientific research programs.

Pagano is the founding director of the UNC Lineberger Comprehensive Cancer Center and an internationally recognized virologist known for his work with Epstein-Barr virus, a virus that is associated with Hodgkin's lymphoma and nasopharyngeal carcinoma, and on antiviral drugs.

Ewend honored with Alumni Achievement Award from Johns Hopkins University School of Medicine

Matthew G. Ewend, MD, director of the UNC Lineberger Comprehensive Cancer Center program in neuro-oncology, recently received the Alumni Achievement Award from the Johns Hopkins University School of Medicine's Department of Neurosurgery.

The award, presented by the office of the dean, recognizes distinguished achievement in the field. Ewend is the fifth recipient of the award, joining renowned neurosurgeon Irving J. Sherman (for whom a research professorship at Johns Hopkins is named); Hugo V. Rizzoli, chair of neurosurgery at George Washington University; George Udvarhelyi, emeritus professor of neurosurgery at Johns Hopkins; James Campbell, a noted leader in functional neurosurgery, and; Edward R. Laws, Jr., director of neuroendocrinology at Harvard's Brigham and Women's Hospital.

Ewend

Ewend is the chief of the division of neurosurgery in the Department of Surgery and holds the Kay M. & Van L. Weatherspoon Distinguished Professorship at the UNC School of Medicine.

He is board certified in neurological surgery and his clinical focus is in multidisciplinary clinical neuro-oncology with a focus on brain tumors, pituitary tumors, pediatric neurosurgery, brain and spinal metastases and minimally invasive surgery. He earned his MD and completed his residency in neurosurgery at Johns Hopkins.

Coleman receives American Academy of Pediatrics award

William L. Coleman, MD, was honored with a Recognition of Service award in May 2009 from the American Academy of Pediatrics for his 8 years of service, including being chair of the AAP committee on psychosocial aspects of child and family health, which develops policy statements and technical-clinical reports for the AAP, as well as many family practitioners' on issues that impact child and family development and well being.

Coleman is a professor of pediatrics at UNC and assistant consulting professor of pediatrics at Duke. He completed his pediatric internship and residency at Duke University Medical Center where he was awarded the Golden Apple as the outstanding teaching resident among all residents in all departments in the medical center.

His research and clinical interests include family-

oriented approaches to the evaluation and management of developmental and behavioral problems in children and adolescents, neurodevelopmental assessment of learning differences, and children's mental health issues. He has been a faculty member at UNC's Clinical Center for the Study of Development and Learning since 1985.

Segal elected to prestigious fellowship by APTA

Rick Segal, PhD, professor and director of the Division of Physical Therapy in the UNC School of Medicine, has been elected as a 2009 Catherine Worthingham Fellow of the American Physical Therapy Association, the most prestigious recognition granted by the organization. Segal received the honor at a ceremony in Baltimore recently as part of the association's annual national conference.

Segal

About 130 of the association's 65,000 members serve as Worthingham fellows. The fellowship category was established in 1980. Two other UNC faculty have been named Worthingham fellows, Margaret Moore and Michael Gross. "There are many great contributors to the field of physical therapy who are fellows and many that are more deserving than me who have not been elected. Thus, I am very humbled to be a Worthingham fellow," said Segal.

The fellowship is named for Catherine Worthingham, who served on the APTA's board intermittently from 1932 to 1965, was APTA president from 1940 to 1944, and was the first physical therapist to earn a doctoral degree. Worthingham passed away in 1997.

North Carolina's first master's program in molecular diagnostic science launched at UNC

In June, the UNC-Chapel Hill Division of Clinical Laboratory Science held its first annual lecture and reception to celebrate the start of the division's new master's degree in Molecular Diagnostic Science (MMDS) and the launch of the MDS Corporate Partners Program. Dr. Thomas K. Huard, PhD, scientific director of molecular diagnostics with Quest Diagnostics, delivered the kick-off lecture focusing on the future of the molecular diagnostic science industry. The program is the first of its kind in North Carolina.

"The MDS Corporate Partners Program recognizes the close link between molecular diagnostic testing in the clinical laboratory and the products, services, and technology offered by the private sector," said Susan Beck, PhD, professor and director of the Division of Clinical Laboratory Science. "Leaders in the molecular diagnostics industry help to support the MMDS program because of the great need for qualified laboratory professionals who can perform molecular tests, bring new assays into a laboratory, and work with issues related to molecular testing."

Beck awarded two student scholarships at the event that were made possible by the generous financial support of the MDS Corporate Partners. "We are very excited about showcasing our partnerships with these leading companies in the molecular diagnostic industry and are extremely grateful for their support," she said. The MDS Corporate Partners Program founding gold partners are Abbott Molecular, Applied Biosystems, BD Molecular Diagnostics, Gen-Probe, McKesson Corporation, Quest Diagnostics, Roche Diagnostics Corporation, and ZeptoMetrix Corporation.

The Division of Clinical Laboratory Science, one of seven divisions within the Department of Allied Health Sciences in the UNC School of Medicine, prepares health professionals who provide the laboratory information and services needed for the diagnosis and treatment of disease. The division offers a baccalaureate degree in Clinical Laboratory Science (CLS) and a new master's degree in Molecular Diagnostic Science (MMDS). The division has clinical affiliations with UNC Hospitals in Chapel Hill, Duke University Medical Center and the Veteran's Affairs Medical Center in Durham, and Nash Health Care Systems in Rocky Mount.

American Board of Internal Medicine elects Lee R. Berkowitz, MD, to board of directors

Lee R. Berkowitz, MD, the Eunice Bernhard distinguished professor of medicine and associate chair for education in the Department of Medicine at UNC, has been elected to the American Board of Internal Medicine (ABIM) Board of Directors. ABIM sets the standards and certifies physicians practicing in internal medicine and its subspecialties who possess the knowledge, skills and attitudes required to provide high quality care.

The board of directors, composed of physicians who are board certified in internal medicine and one of its subspecialties, guides ABIM's overall mission and direction as it works to improve health care quality. All ABIM Directors participate in ABIM's Maintenance of Certification program, which promotes ongoing learning and in which doctors demonstrate their commitment to the Board's standards. Berkowitz is board certified in internal medicine and hematology.

Currently, Berkowitz serves as chair of the Alliance for Academic Medicine's task force on education redesign of graduate medical education. He has served as president of the Association of Program Directors in Internal Medicine and as chair of the test writing committee of the American College of Physicians In-Training examination.

"Lee is a uniquely qualified leader in medical training, and his experience and expertise will be invaluable to our Board. He also brings the perspective of a subspecialist in hematology, given the important growth of subspecialties on the internal medicine landscape," said Christine Cassel, MD, ABIM's president and CEO.

Berkowitz completed his medical degree at the Ohio State University College of Medicine. He did his residency and chief residency in the Department of Medicine at UNC. He later completed fellowship training in hematology at Washington University and UNC.

School of Medicine's Academy of Educators recognizes seven faculty for teaching excellence

The UNC School of Medicine Academy of Educators recognized seven faculty for teaching excellence at their annual Evening of Scholarship event held last May.

Marianna Henry, MD, associate professor in the pediatric pulmonary division of the Department of Pediatrics, and Suresh Nagappan, MD, the pediatric clerkship site director at Moses Cone Health System, were chosen to receive the Clinical Preceptor Excellence in Teaching Award. This award recognizes faculty who are excellent teachers and role models for medical students during their clinical training. Henry consistently receives high evaluations from learners at all levels. Students claim she is the "consummate clinical educator, one who takes the time to really listen to students and teach them to think like a physician." Nagappan is a role model and stellar teacher for medical students educated in pediatrics at Moses Cone Hospital. Students say he is dedicated not only to them, but also to the process by which each of them gets to be the best doctor he or she is capable of becoming.

Henry

Nagappan

Jane Brice, MD, associate professor in the Department of Emergency Medicine was chosen to receive the Medical Student Research Mentor Award. This award recognizes excellence in training medical students in the fundamentals of medical research and research ethics. Brice has mentored numerous medical and graduate students, residents and fellows in research as well as developed a unique program that provided preclinical medical students with a structured summer research experience. The track record of this program is extraordinary. Of the 50 medical students that Brice has mentored over the past decade, 22 of them have received research awards or grants for their work. Many have now completed their clinical training, joined academic faculties and are pursuing clinical research.

Brice

Parker

Leonard A. Parker, Jr., MD, associate professor in the Department of Radiology was chosen to receive the Medical Student Advisor Award. This award recognizes dedication and effectiveness as a medical student advisor for faculty who are not officially part of the School of Medicine advising system. One student said of Parker, "It is difficult to write a sober professional letter about a person who has been and continues to be so important to me. Dr. Parker has offered help at every turn, often without being asked." Another said, "No matter how old or sophisticated we think we are, we need other people along the way. One person can make the difference. In my four years at UNC, Dr. Parker has been that person."

Gilliland

McNeal-Trice

Kurt Gilliland, PhD, assistant professor in the Department of Cell and Developmental Biology, and Kenya McNeal-Trice, MD, assistant professor in the Department of Pediatrics, were chosen to receive the Innovation in Teaching Award. This award recognizes innovation in medical student teaching. Gilliland was recognized for co-authoring an online textbook of clinical anatomy and developing online clinical cases for first-year medical students. McNeal-Trice was recognized for developing a first-of-its-kind transition to pediatric internship elective for fourth-year medical students.

Montgomery

Royce Montgomery, PhD, professor in the Department of Cell and Developmental Biology was chosen to receive the Lifetime Achievement Award. This award recognizes faculty who have demonstrated sustained excellence in teaching and mentoring medical students over 10 years or more. During his 44 years at UNC, he has taught approximately 7,000 medical students. He has not simply lectured to these students in impersonal and large lecture halls. Rather, he has interacted with each and every one individually and personally in the dissection laboratory. Montgomery's teaching has been recognized on many occasions, as evidenced by 13 previous teaching awards.

The UNC School of Medicine Academy of Educators was founded in October 2006 as a part of the School's strategic plan to enhance research and scholarship towards excellence in teaching. The mission of the Academy is: To promote and support excellence in teaching and the work and career paths of excellent teachers; to promote and fund curricular innovation, evidence-based curricular change and a scholarly approach to the education mission; and, to provide a forum for education leadership and advice for the dean, vice dean for academic affairs, executive associate dean for medical education, and the leadership of the curriculum.

UNC alumnus Francis Collins nominated to head NIH

On July 8, President Barack Obama announced his intent to nominate Francis S. Collins, MD, PhD, as director of the National Institutes of Health at the Department of Health and Human Services.

President Obama said, "The National Institutes of Health stands as a model when it comes to science and research. My administration is committed to promoting scientific integrity and pioneering scientific research and I am confident that Dr. Francis Collins will lead the NIH to achieve these goals. Collins is one of the top scientists in the world, and his groundbreaking work has changed the very ways we consider our health and examine disease. I look forward to working with him in the months and years ahead."

Collins, a physician-geneticist noted for his landmark discoveries of disease genes and his leadership of the Human Genome Project, served as director of the National Human Genome Research Institute (NHGRI) at the National Institutes of Health from 1993-2008. With Collins at the helm, the Human Genome Project consistently met projected milestones ahead of schedule and under budget. This remarkable international project culminated in April 2003 with the completion of a finished sequence of the human DNA instruction book. In addition to his achievements as the NHGRI director, Collins' own research laboratory has discovered a number of important genes, including those responsible for cystic fibrosis, neurofibromatosis, Huntington's disease, a familial endocrine cancer syndrome, and most recently, genes for adult onset (type 2) diabetes and the gene that causes Hutchinson-Gilford progeria syndrome. Collins has a longstanding interest in the interface between science and faith, and has written about this in *The Language of God: A Scientist Presents Evidence for Belief* (Free Press, 2006), which spent many weeks on the *New York Times'* Best Sellers list. He has just completed a new book on personalized medicine, *The Language of Life: DNA and the Revolution in Personalized Medicine* (HarperCollins, to be published in early 2010). Collins received a BS in chemistry from the University of Virginia, a PhD in physical chemistry from Yale University, and an MD with Honors in 1981 from the University of North Carolina at Chapel Hill. Later, he was chief resident of internal medicine at UNC Hospitals. Prior to coming to NIH in 1993, he spent nine years on the faculty of the University of Michigan, where he was an investigator of the Howard Hughes Medical Institute. He has been elected to the Institute of Medicine and the National Academy of Sciences, and was awarded the Presidential Medal of Freedom in November 2007.

Dr. Francis Collins

50s

David L. Kelly, Jr., MD '59, a professor in the Department of Neurosurgery at Wake Forest University's School of Medicine, received the Distinguished Practitioner Award from the Southern Neurosurgical Association on March 28, 2009.

60s

George C. Hemingway, Jr., MD '63, practiced primary care medicine and pediatrics for 28 years in Tarboro, NC, before deciding to retire. He and his wife, Lyn, have been married 50 years and have three children and six grandchildren. The couple spends their time with their children and fishing.

James Powers, MD '69, has been elected president of the Sibley Memorial Hospital medical staff the past two years. He continues to practice gynecology and surgery. He has five grandchildren between the ages of 4 mos. and 8 years. He lives in Washington, DC.

70s

G. Dean Wilson, BSMed, MD '72, retired as CEO and founder of Tri-State Mountain Neurology Associates in 2006. Wilson remains a neurology consultant and keeps all of his licenses and CE's up to date. He says he began a "new career" in 2007 as caregiver for his 88-year-old father and his estate. He lives in Johnson City, Tenn.

John J. Cannell, MD '76, is the executive director of of the Vitamin D Council and a forensic psychiatrist at Atascadero State Hospital in California. His research on the relationship between vitamin D deficiency and autism was the subject of an article in the April 2009 issue of *Life Extension Magazine*. Cannell credits UNC School of Medicine Department of Surgery Chair Emeritus and Byah Thomason-Sanford Doxey Distinguished Professor Colin G. Thomas, Jr., as his mentor and the individual who had the greatest influence on his thinking and writing.

80s

Gordon Early, Jr., MD '87, married Lee Willis in Greenville, SC, on May 2, 2009. They reside in Spartanburg, SC.

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In Memoriam

Stacy Allen Duncan, Jr., MD '56, 80, of Dunn, NC, died Friday, May 15, 2009, at Betsy Johnson Hospital with his wife and daughter by his side.

Duncan was born in Smithfield, NC on April 9, 1929, the only child of the late Dr. Stacy Allen Duncan, Sr. and Mary White Duncan of Benson. He graduated from UNC School of Medicine in 1956 and married a fellow student, Margareta "Peggy" Johnson. He began his two years of service in the US Air Force as a flight surgeon after graduation. In 1960, they moved to Dunn and opened the joint family practice of Drs. Duncan & Duncan, PA, and offered medical services for the next 40 years. His hobbies were hunting and fishing as well as extensive traveling abroad with his wife, but his biggest passion was their medical practice servicing the people of their community.

Survivors include his wife of 56 years, Margareta J. Duncan, MD; a daughter, Mary Kimberly Duncan of San Diego, Calif.; two sons, Gary H. Duncan, DDS, PhD, of Montreal, Canada, Stacy Allen Duncan, III of Oconomowoc, Wis.; grandchildren, Alan, Danielle and Stella Duncan, and Sara and Dana Ashcraft. In lieu of flowers, the family requests donations be made to his mother's namesake library, Mary Duncan Library, 100 West Main Street, Benson, NC, 27504.

Carl Warren, Jr., MD '59, 81, of Charlotte, died peacefully at his home on Wednesday, January 21, 2009. Carl was born on June 29, 1927 in Louisville, Kentucky. The son of the Rev. Casper Carl Warren and Mary Lashbrook Strickland Warren, Carl grew up in Danville, Ky., and Little Rock, Ark. They moved to Charlotte, NC, in 1943.

Upon graduation from Charlotte Central High School, Carl enrolled at Wake Forest College. His education was interrupted by his service in the US Navy at the end of WWII. Carl returned to Wake Forest College and in 1949 earned a BS degree. Later in 1949, Carl taught physics and math at Campbell College in Buies Creek, where he met his wife, Josephine Lovette. Warren Carl became an instrument engineer for the DuPont Corporation in 1951 and worked in Oak Ridge, Tennessee, and Aiken, South Carolina, for several years. In 1954 he enrolled in the UNC School of Medicine. He earned his medical degree in 1959 and, upon completion of his internship at Watts Hospital in Durham, practiced medicine in Wadesboro until 1964. Carl returned to UNC-Chapel Hill to specialize in anesthesiology and completed his residency in 1966. He returned to Charlotte and worked at Mercy Hospital until 1974. He then joined Presbyterian Anesthesia Associates PAC at Presbyterian Hospital where he practiced as a board-certified anesthesiologist for 18 years.

Carl was a long-time member of St. John's Baptist Church and served as a deacon, chairman of the board of deacons and in numerous committee positions. In 1994 he served on a medical missionary team to Rwanda at a camp for displaced and orphaned children. Carl also volunteered with Habitat for Humanity. He was a member of the North Carolina Medical Association and recently received recognition for 50 years of service.

Carl had many and varied interests. He loved boating, fishing, camping and woodworking. His interest in airplanes culminated in earning his private pilot's license at age 51, an interest he passed along to his five children and through numerous trips to the Experimental Aircraft Association fly-ins in Oshkosh, Wis. Carl enjoyed golf and was a longtime member of Myers Park Country Club. He had a lifelong passion for music and reading. He especially enjoyed spending time at his Lake Norman home, working in his woodshop and building model ships.

Carl is survived by his wife of 58 years, Jeck Warren; five children, Bob Warren, David Warren, Mary Jo Breckenridge, Mark Warren, and Cathy DuFault, all of Charlotte; 13 grandchildren; and two great-grandchildren.

John Norton in the new N.C. Cancer Hospital Photo by Rachel Garrison

The Carlson Family Foundation: Celebrating and Remembering

The Carlson Family Foundation has supported UNC Lineberger Comprehensive Cancer Center's research in multiple myeloma for the past five years. Foundation member John Norton was just 35 when he was diagnosed with chronic myeloid leukemia. His wife, their two daughters, and his mother moved to Seattle in 1995 so he could have a bone marrow transplant at the Fred Hutchinson Cancer Research Center. He was fortunate to have two siblings who were perfect matches for the transplant.

Then, five years ago, his brother Tom tragically died from multiple myeloma. Although John and his family have benefited from all the hard work and research from institutions like UNC Lineberger; they have also suffered a loss and understand what it is like when effective treatment options are not available. They have witnessed the incredible advances in cancer research and treatment made over the last 15 years and know how important it is that this research continues.

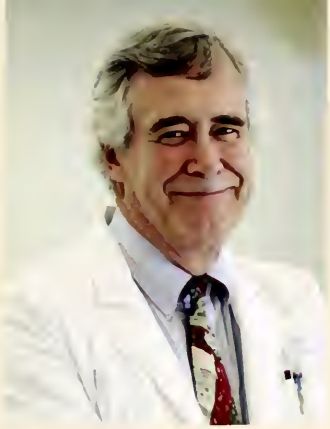
In addition to their interest in research, Norton and the members of the Carlson Family Foundation were very excited to learn about the N.C. Cancer Hospital.

In April 2009, they decided to make a gift to name the Bone Marrow Transplant Inpatient Recreational Therapy Room in memory of Tom Norton. This room will allow bone marrow transplant patients to interact with others and get exercise that benefits their recovery without the risk of picking up an infection while their immune system is compromised.

The Carlson Family Foundation is proud to be affiliated with UNC Lineberger and its members believe that they can and will make a difference in the lives of North Carolinians and beyond.

. . . . . .

Because the construction of the N.C. Cancer Hospital was funded through the generosity of the State of North Carolina, gifts to the N.C. Cancer Hospital are focused exclusively on supporting critical programmatic, faculty and clinical research priorities as well as providing necessary startup funding for unique and expanded patient support and services. Naming gifts will be recognized on a special donor recognition wall in the main lobby of the N.C. Cancer Hospital.



Making a difference:

UNC Cancer Network's **statewide reach**

By Thomas C. Shea, MD
Director, Bone Marrow Transplant, Division of Medical Oncology
Associate Director for Outreach Programs,
UNC Lineberger Comprehensive Cancer Center

The N.C. Cancer Hospital is a great symbol for the outstanding clinical programs of the UNC Lineberger Comprehensive Cancer Center and we're proud to open a state-of-the-art facility.

As attendees at our grand opening celebrations and open houses tour the hospital, they may not realize that the N.C. Cancer Hospital also serves as the nerve center for the UNC Cancer Network. This network provides the umbrella under which multiple cancer outreach programs serve more than half of North Carolina's 100 counties.

We are looking forward to seeing patients at our new multidisciplinary clinics in the hospital, where they will receive the same outstanding team-based care they have come to expect from UNC. But many people don't know that, in addition to seeing UNC oncologists here in Chapel Hill, there are also several sites across the state where we hold specialty clinics to see a wide range of patients, ranging from those needing bone marrow transplants to neuro-oncology and breast cancer treatment.

In addition to seeing patients in their communities, we use our aggregate expertise in multiple disciplines to consult with physicians from across the state to provide second opinions and specialized expertise. One of the important factors in planning the N.C. Cancer Hospital was on-site conference rooms where we will hold our multidisciplinary conferences and develop individualized treatment plans. These conference rooms are now equipped with high-definition teleconferencing equipment. This equipment allows physicians from across the state to discuss their patients with our teams of specialists, with whom they can view and discuss pathology slides and reports, scans, and test results in real time. The high-definition video equipment will allow records to be shared among participating doctors in communities across North Carolina instantaneously.

As we develop new knowledge and incorporate the latest research findings in the care of our patients, we're also asking ourselves how we can share what we have learned with patients and health care providers outside of Chapel Hill. That's where NC SPEED comes in. The Statewide Push for Excellence, Engagement and Delivery (SPEED), under the direction of Cathy Melvin, PhD, provides a community-based infrastructure to help take the latest research findings to local healthcare providers and community organizations in almost 50 communities across the state. NC SPEED works with community-level personnel to develop wellness, behavioral, screening and other prevention programs that are based on the latest research about what works.

We're also proud of the work being done statewide by Carolina Well, UNC Lineberger's survivorship program. Carolina Well is proud to be one of only eight network member institutions in the nation and the only one in the Southeast to be part of the Lance Armstrong Foundation's LIVESTRONG Survivorship Center of Excellence Network.

Cancer survivors often have special concerns about their health and wellness and need different services than those who haven't experienced cancer. As part of that effort, we are networking with other organizations across the state to understand the services available in local communities, identify current gaps in cancer services and refer survivors to their own local community resources. Carolina Well is also partnering with communities across the state, including Guilford, Sampson, Pitt, and New Hanover counties, to coordinate survivorship programs, offer local educational and training programs for cancer survivors and caregivers including peer counseling, and continuing education for health professionals.

Keeping North Carolinians healthy, helping patients with cancer get the very best treatment and support, and ensuring that survivors have access to the services they need is a big job. We are looking forward to more partners and communities joining us in UNC Cancer Network activities and to extending the reach that the N.C. Cancer Hospital brings to the program through state-of-the-art technology.

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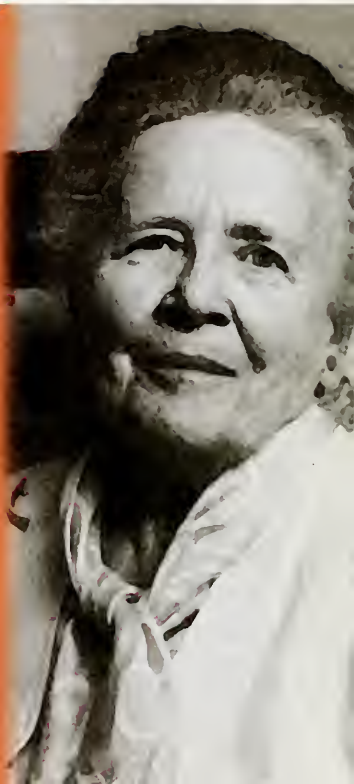
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